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Textile World

A McGRAW-HILL PUBLICATION

FEBRUARY 28, 1939

Annual Review and Forecast Number

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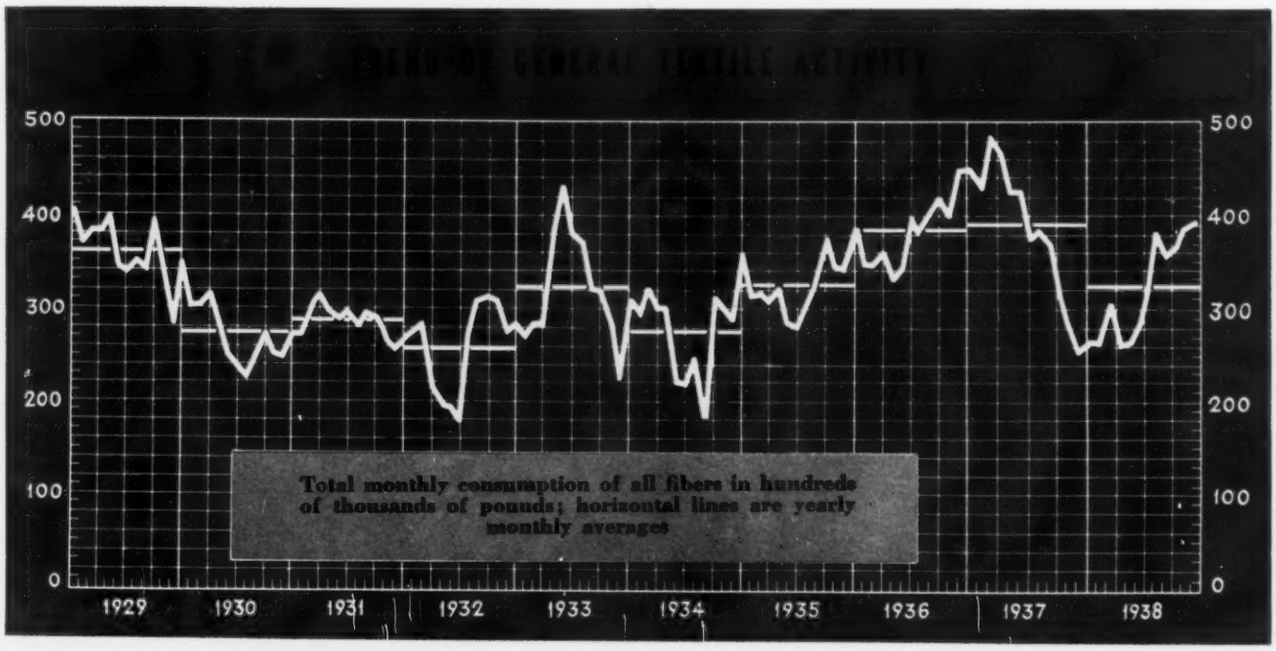
Textile World

FEBRUARY 28, 1939

DOUGLAS G. WOOLF, *Editor*

ANNUAL REVIEW AND FORECAST SECTION



Prediction: Generally Clearing

BETTER TIMES BECKON IN 1939 AFTER THOROUGHLY LOUSY YEAR IN 1938

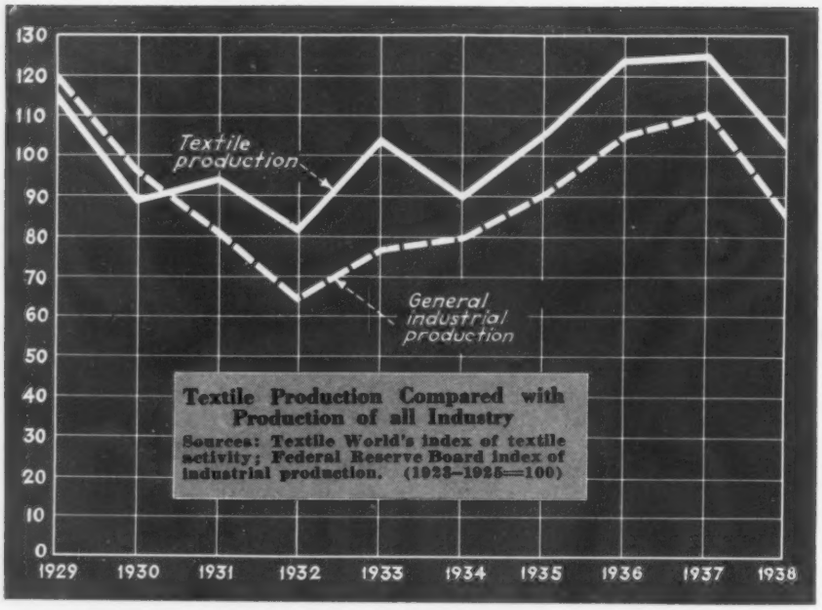
ONLY A CROSS between a Pollyanna and an ostrich would call 1938 anything but a sour textile year. Since we have no desire to emulate either, and particularly since we think a cross between the two must be something awful, we go on record as putting thumbs down on last year. To textile manufacturers, and to those who sell to textile manufacturers, it was a supreme headache. Volume was down; price margins shrank; and as a result of the combination, corporate profits of 1937 turned into losses of 1938.

Statistically, the year closed with a volume record which does not fully disclose the grief. TEXTILE WORLD'S index of textile mill activity showed an 18% decline from 1937. That it was not worse was due to the recovery in the last part of the year. A glance at the above chart will show the dismal course of events during the first half, following the collapse in the fall of 1937. In fact, by the middle of 1938 it looked as if an all-time low would be set by the year. TEXTILE WORLD'S index for the first six months registered a 40% decrease from the corresponding period of the previous year. Fortunately, the tide changed in the last half; activity was 38% greater than during the first six months with the result that the total activity for the year was only 18% below 1937.

The nearest recent counterpart to 1938 was 1935. In that year, too, recovery in the last part saved the record. Comparison of 1938 with other years back to and including 1929, is shown in the following table of TEXTILE WORLD'S textile mill activity index:

1923–1925 average = 100	
1929	115
1930	89
1931	93
1932	83
1933	104
1934	90
1935	105
1936	124
1937	125
1938	103

It will be noted that 1938 was



Textile Production Compared with Production of all Industry

Sources: Textile World's index of textile activity; Federal Reserve Board index of industrial production. (1923–1925=100)

above what is still used as a "normal" year—the 1923-25 average.

The Sad Part of the Story

But we said before that statistics do not tell the whole story. That is found in the "profit" possibilities. (We use quotation-marks advisedly.) Prices in the primary textile markets failed to reflect the improved demand in the last part of the year. In fact, in some branches of the industry, manufacturing margins went down, as volume of sales went up. In staple cotton fabrics, for example, TEXTILE WORLD's compilation of margins showed a drop from 16.5¢ in July to 14.4¢ in December, despite the fact that cotton consumption in the last six months of the year was 23% greater than in the first six.

Those who want the real low-down on the effect of this cock-eyed situation will find it in the corporate financial statements for the calendar year 1938. These are coming out right along now, and don't make pleasant reading. We took seven as they came across our desk in the last week — representative companies in different branches of the industry and in different sections of the country. The combined net profit of $2,022,535 in 1937 was changed to a combined net loss of $2,649,844 in 1938. This may not represent the average percentage change for the industry as a whole, but it very definitely shows the trend.

And Now . . . What's Ahead?

We feel better, now that we have that out of our system. And, fortunately, it is a more pleasant task predicting for 1939 than it was for 1938. A year ago, the business world was completely lost in a fog. Hell had broken loose in the fall of the previous year. Stock prices had collapsed, and the industrial structure followed suit. A boom was changed over-night to another depression. No one seemed to know whether or not we were in for another 1929-33 siege. It was recognized that, at the very least, the first half of the year would be tough going.

This year, the situation is completely reversed. The second depression has been arrested, recovery is definitely under way, and the outlook in general business is for a continued upward movement for the first half at least, with no reason to expect a recession in the last half. (All this is with the usual qualification about the Wild Men of Europe. We never answer a question from even our six-year old nowadays without inserting that clause. It should be required in all contracts.)

Textiles not only should share in this continued recovery, but should pace it. (The chart on this page shows that textile activity continues to run ahead of general industrial production.) 1939 is slated as the good year in the two-year textile cycle. Also, inventories in most quarters are low, and any real demand should justify a good production rate.

We shall try to put this prediction in hard, cold figures. Last year, in the year-end review and forecast similar to this, we stated that "the chances (in the textile mill activity) are for a decline in 1938 from 1937, say, about 10%." The final figure was 18%. We are content with the approximate accuracy of our prediction; we are not running a numbers game.

For 1939 we would expect textile mill activity to run about half-way between 1937 and 1938. That would mean about 115 on the basis of 1923-25 as 100. (See table on previous page.) Incidentally, it would mean a rate the same as 1929, if that means anything nowadays.

That refers to activity only, not to prices and "profits." To make a lousy but accurate pun, textile prophets cannot extend to profits.

Our tendency would be to feel discouraged right now, if it were not for many under-surface indications that a large part of the industry is getting fed up with the eleemosynary character of the business it operates.

Question . . . and Answer

WHEN WE ASKED the question "Can a Textile Man Make Money?" last October, some of our readers thought at first we were indulging in rather macabre humor. But, as they thought it over, they realized it was a perfectly fair question, and began to ask themselves the same thing. Consequently, when we decided to use that as the theme for the special section of this, the 1939 Annual, we found a live interest in its many ramifications. We asked the question of a sample group of our readers. Their answers start on Page 80.

Our own answer is still: Yes, IF . . . And since the IF's are the important part of the answer, we direct attention to the articles analyzing them, following immediately after the Readers' Forum mentioned above.

One thing we *do* know positively: IF the textile industry doesn't start making money pretty soon, and continue to do so for a period longer than six months or a year at a time, there are a lot of men and mills in it today, who won't be in it a few years from now.

And IF we had to isolate any one IF from the special section starting on page 79, we would lean to the suggestion that a textile man *can* make money, IF he includes a profit in his price. The contributor of that idea admits that it may be considered an oversimplification of the problem. And there are of course forces always at work which make the answer not quite so simple as that. But let's put it another way: A textile man can *never* make money IF he doesn't include a profit in his price.

Think that one over.—*Editor.*

Annual Machinery Survey

SALES OFF 30% FROM 1937, BUT RECOVERY ALREADY STARTED IN 1939

***This is the 1938 instalment of TEXTILE WORLD'S serial story on sales of textile machinery and supplies. Started in 1929, this gives a comparative picture for the depression, recovery, recession, and second recovery periods. It is made possible by the cooperation of the manufacturers who give us confidential information concerning their sales for the year just closed, and their prospects for the year to come.*—Editor.**

IT WILL NOT be a surprise to anyone, we are sure, to learn that sales of textile machinery, auxiliary equipment, accessories and supplies fell off in 1937. The only question has been the extent of the drop. It will be recalled that a glorious textile boom was arrested in the fall of 1937, and that from then till the middle of 1938 a progressive collapse ensued. Naturally those who wanted to sell to textile mills were more or less out of luck.

The net result was a 30% drop from the 1937 dollar volume of machinery sales to that of 1938. The record for the last 10 years, as shown by TEXTILE WORLD'S index (in which 1929 = 100) follows:

1929	100
1930	67
1931	57
1932	39
1933	56
1934	63
1935	74
1936	94
1937	104
1938	73

In other words, the steady climb which started in 1933 has been checked at last, and the level has been put back approximately to that of 1935. The 1938 sales were 27% below 1929. However there was no collapse to the level at the depths of the depression when, in 1932, sales were 61% below 1929!

The 1938 drop of 30% from 1937 was fairly uniform in the different branches of the industry, with one exception: Knitting machinery sales were only 8% below the previous year. This was due to the rapid plant expansion, particularly in the full-fashioned end. In fact certain knitting equipment firms had 1938 sales records well above 1937.

As for the other branches, the preparatory, spinning and weaving equipment group was 39% off; bleaching, dyeing and finishing equipment 32% off; and auxiliary equipment, accessories and supplies, 38% off.

An interesting fact shown by the study is that those companies which brought out outstanding new models usually had sales records above the average for the industry as a whole.

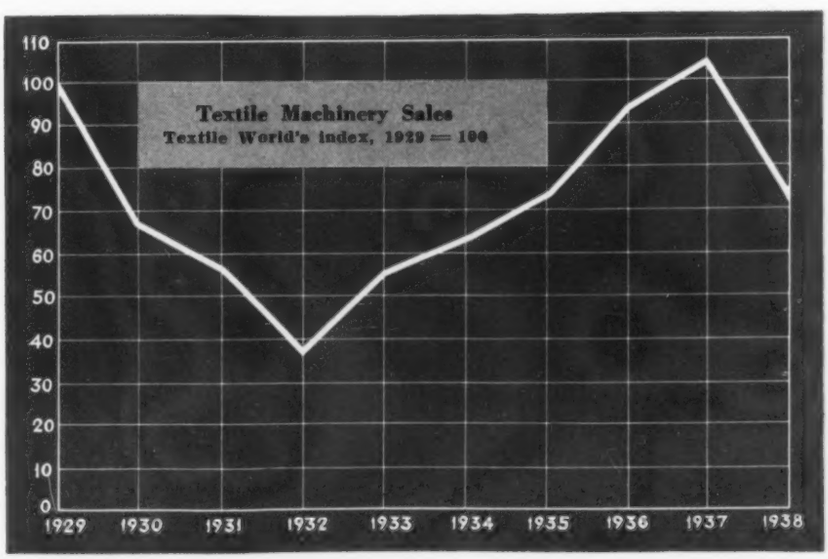
Looks Good for 1939

One advantage of reviewing an off year like 1938 is that the sentiment for the year to come is usually hopeful. A year ago, our returns were pretty gloomy. This year 86% of the manufacturers who contributed to the survey are optimistic—and of the remaining 14%, 7% are pessimistic and 7% are on the fence. The aver-expectation of improvement in 1939 is approximately 30% over 1938. In fact, the prediction was often made that the coming year would run about flush with 1937. If that materializes, it ought to be good enough to please most people. In many cases the present hopeful attitude is based on increased orders actually in the bag.

WHAT THEY SAY

Reflecting that comfortable position are the following extracts from letters received in our survey:

- "Business is now running well ahead of the same period in 1938."
- "The outlook is much better, and we are looking for an upward trend of sales, as the mills are fairly busy and we are starting out the year with some very nice business."
- "Prospects for the first six months of 1939, at least, are exceptionally good."
- "The first month of 1939 is starting out in a far more valiant fashion than did the first month of the late unlamented 1938."
- "1939 has started off with the largest backlog of orders we have had in some time, and we seem to be assured of an active first six months."
- "Our sales to the textile industry started to increase in October 1938 and have been gradually expanding since. We look for a splendid spring and good summer and fall in 1939."
- "As far as indications for 1939 are concerned, we are certainly more optimistic than we were last year. We are already sold out for the first six months."
- "At the present moment, we have two large inquiries for machinery and it would seem to us that the out-



look for 1939 is very much better for machinery sales than it was for 1938."

• "Our unfilled-orders curve turned upward in December for the first time in eighteen months, which should be an indication of one thing or another."

• "We are already sold ahead eight to ten weeks, which is very unusual for this time of the year."

• "January has started off in a very satisfactory manner. The inquiries are good and prospects in general seem quite encouraging. January actual business is real good."

• "December was an 'old time' month and the orders on hand today and prospects are better than at any time in many months."

Here is a more restrained prediction:

• "There really seems to be some justification for believing that we are approaching what might be considered a normal, although not a high, year. We shall be glad to have it stay at a normal rather than go through all those boom and depression periods."

The following is typical of many expressions received in the survey:

• "While 1939 apparently will not be a year of sharply rising business, we do believe we should gain back this year approximately what we lost last year in total sales."

The Sour Side

On the other hand, the relatively few pessimists had things like these to say:

• "We are not very optimistic. In our particular field, the industry is over machined, and outside of the general run of small repair parts, we do not feel that we can expect to build any great volume of new equipment."

• "The outlook for textile sales in 1939 appears quite unsettled to us."

• "I am not too optimistic. Farm income is low, and that very large group of American people do not have the purchasing power which seems necessary to support a prolonged period of good business. Through government spending and governmental regulation of wages, we may be able to stimulate business for a few months, but with so large a group of our people—the farmers—unable to buy I hardly see how we may expect a prolonged period of good business."

Bricks for the White House

The last quotation touched, but then shied away from, a subject which is in the minds of a good many of our correspondents. Here are a couple of samples:

• "As for foretelling 1939 the only thing that looks good is that most of the trade indices show an upward trend but with our wild man in the White House and three of them in Europe it does not look so good. Here's hoping."

• "As to 1939, *you* tell us. An ancient judge once remarked 'No man may judge the mind of man for the devil himself knoweth not what a man thinketh.' Until we can, looking through the glass darkly, discern what The Perfect Intelligence at Washington has on the IQ, 1939 is an unsolved riddle."

Our Old Friend Modernization

Here are two observations on the need for modernization:

• "The outlook for 1939 for the installation of new textile machinery is better, the principal reason being that the financial men (especially the banking interests) are realizing that the well equipped mills have a chance of success, while the poorly equipped mills have under present conditions very little chance. This elementary fact is well known to the mill managers but the last year or two they have not had money enough to act. Lately, however, business has been better in the mills; they have been making a little more money, and all the responsible mills will give serious consideration to the installation of new machinery during 1939."

• "If the more up-to-date and progressive plants could get themselves into the proper frame of mind to take care of obsolescence, which has definitely not been the case for the past six or seven years, we would naturally see some good business."

On two specific problems, contributors to the survey offered the following thoughts:

• "The printing, dyeing and finishing and processing of spun rayon fabrics has probably the most attractive outlook for 1939 and the coming years. There still remains a great deal to be done by technicians in the way of simplifying processes and the treating of spun rayon fabrics. Finishers are presented with many problems, the way they were back in 1930 and 1931 on all-rayon crepes. Eventually we shall probably arrive at some predetermined and proven types of equipment modified from the higher types of cotton finishing equipment which will serve more generally the purposes of the mills which are specializing on processing spun rayons."

• "A majority of the cotton mills are simply equipped with head humidification systems. With the introduction of long-draft spinning the internal head loads are materially increased, that is more power is required to drive machinery. That means that old head systems are no longer properly functioning and well engineered systems introducing measured amounts of outdoor air in combination with the old head systems must be put in for proper operation."

• "We are following a plan that we laid out for ourselves several years ago, and that is, to redesign our complete line of equipment, with an eye to producing better mechandise at lower costs, making the machines more practical and giving them some eye appeal. We have accomplished a great deal of this already, and we see it beginning to bear fruit. We believe that we are on the right track and are going to continue with our policy."

Activity by Branches

General textile activity, as noted in the first article in this issue, was 18% less in 1938 than in 1937. By branches of the industry, the comparison, as shown by TEXTILE WORLD's index was as follows:

Cotton: ***1938 activity approximately 20% below 1937.***

Wool: ***1938 activity 11% below 1937.***

Silk: ***1938 activity 3% below 1937.***

Rayon: ***1938 activity 2% above 1937—the only textile fiber to show increased consumption last year.***

Incidentally, it is interesting to note that hosiery shipments in 1938 were 1.8% ahead of 1937. This branch of the industry, as has been noted previously, ran counter to the trend in textiles generally.

COTTON MANUFACTURE

By Horace L. Pratt
West Point Mfg. Co.
Shawmut Mill Division, Shawmut, Ala.

DEVELOPMENTS in cotton manufacturing during 1938 have for the most part reflected the imperative need for greater efficiency and reduced costs. Thus, the primary purpose of much of the new equipment introduced during the last year is to permit the cotton manufacturer to increase the efficiency of his mill. This is true, for example, of a new drive for picker calender rolls, stop motions for spinning frames, and automatic bobbin winders. Again, installations in a number of mills of auxiliary equipment, such as improved mechanical handling equipment and up-to-date lighting systems, are indicative of a definite trend toward making the mill more efficient as a unit. Use of rayon staple in cotton mills continues to increase. While handling of rayon staple is still in what might be considered an experimental stage, sufficient experience has been gained, however, to permit fairly satisfactory machine settings and speeds to be worked out.

Quite remote from actual cotton manufacturing, but of interest to the textile manufacturer, is the matter of experiments being made with a gin which separates the lint from the seed and trash by centrifugal force and air currents. It is hoped to determine the effect of this type of ginning on staple length, quality, and spinnability of cotton, and to ascertain the rate of production with cotton ginned in this manner.

In the picker room, a new chain drive for calender rolls is said to improve doffing. With the new drive, when the picker knocks off at the completion of a lap, the 9-in. calender rolls stop. Thus, the tender is able to tear off the lap with enough stock left to wind around the lap pin, so that starting can be effected immediately. With the older type drives, it was necessary to wait a few seconds for the end of the lap to pass from the nip of the 7-in. calender rolls.

A process for making a new improved card clothing makes use of precision parts which are said to cut the wire clean and free from burrs, and to insure wire that is uniformly shaped, absolutely square at the crown, and parallel throughout its length. Side and top grinding is minimized during manufacture of the clothing, it is reported, because the wires fit flat and square in the foundation, and because the needle-point holes in the foundation are not enlarged as might be the case if burrs were forced through the fabric. For setting grinders to cylinders, doffers, and flats, a card grinder's micrometer gage has been brought out. It is stated that with the aid of this instrument grinders now can be set with mathematical accuracy, permitting a positive depth of cut, and at the same time assuring parallelism. The gage has a range of 0.007 in. and graduations of 0.001 in. each.

Handling of sliver cans is facilitated by a recently developed can with a detachable bail or handle that snaps over the top while cans are being transported to other machines or departments.

There is now on the market a new bottom roving-frame cone with a practical contour, which was developed under the supervision of a well-known textile engineer. This cone is said to allow controlled tension for every layer of roving on the bobbin. Tests made by the manufacturer show that breaking strength of roving made with the new cones is about 7% higher than that of roving made with ordinary cones, while variations in size are somewhat less.

Spinning and Twisting

The spinning room has received its full share of the improvements of the period under review. During the last

year two stop motions were offered for frames equipped with filling wind. One of these is a mechanical stop motion, while the other is electrical and known as a mercury limit-switch. By use of these stop motions, uniformly full bobbins are assured at all times, regular doffing schedules can be maintained, and spinning room production can be increased. Spinners and doffers should be able to attend a few more spindles with no increased effort, thereby benefiting both themselves and the management.

An improved builder motion has been designed to meet requirements of large-package spinning frames and light twisters, one object of which is to produce bobbins with perfectly parallel sides. Certain parts used on older type builders have been eliminated, and the regular commercial chains have been replaced by large hardened-steel chains. It is stated that by means of this builder the vertical speed of the ring rail is kept constant, so that exact diameters of the bobbins are obtained at any point in the stroke.

Other improvements include a new system of roll weighting which makes use of a spring for its source of pressure, thereby obviating the use of heavy bar weights. The weight can be released merely by lifting the front saddle; and by pushing the saddle downward, pressure can be put back on the rolls. A top-roll arbor made from Durex is said to assure adequate lubrication at all times, without over-oiling. It can be inserted in the machine and run for from 6 to 8 months without oiling, at the end of which time it usually is necessary to clean the top of the frame. When this is done, the arbor can be removed and placed in a container of oil overnight, wiped, and again placed in the cycle of operation.

Some interesting accessories which make for more efficient operation of the spinning room are a new cylinder-head drive unit for spinning and twisting frames; a spindle-base dust cap, said to be practically dust- and lint-proof; and a new spindle bolster case. An impregnated spinning tape of thin construction and light weight is said to reduce slippage and to effect a saving in power costs.

An attachment for producing from one roving, a yarn of three distinct counts, giving the effect of a heavy-, a medium-, and a fine-count yarn combined in any sequence in a continuous thread, as well as for making ordinary two-count Himalaya, flake, and slub yarns, has recently been put on the market.

The outstanding feature of a new automatic filling winder now being subjected to mill tests is that when a bobbin is filled, it is automatically ejected from the machine and a new bobbin takes its place; winding is resumed without any help from the operator. Entirely automatic operation of another filling winder developed in Europe is as follows: without attention from the operator, the machine winds a bobbin full, stops the bobbin, lowers it into a tray, inserts a new empty bobbin, cuts the loose thread from the full bobbin, and restarts winding. This winder is designed to handle cotton, wool, rayon, and other yarns of any construction or twist, and in all counts.

To overcome difficulties due to variation in tension in high-speed winding, there has been developed a swinging disk tension, designed to give automatically controlled total tension, regardless of the ballooning of any particular yarn being wound. This disk tension is said to be easy to adjust and easy to keep clean. A special impregnated type of bearing for filling winders is being tried.

Beams measuring 60½ in. between heads and 30 in. in diameter can be run on a warper designed for the specific purpose of warping longer sets. A special feature of this warper is that the working plane, even with the larger beams, is such that the average tender can reach the back comb; this greatly facilitates piecing-up ends. A slasher, designed to take beams produced on the new warper, will accommodate loom beams measuring 114 in. between heads and 24 in. in diameter. To withstand the heavy loads imposed by the larger loom beams now in use, a new friction for slashers has been designed.

Weaving

A rather sketchy glance at loom installations in the cotton manufacturing field reveals the introduction of narrow cam terry looms that are being operated at 182 picks per min. and 85% efficiency. No battery hand is required, and 12 to 14 looms per weaver and 48 looms per fixer are being assigned. Wide dobby upholstery looms are being operated at 142 picks per min. and 85% efficiency. With these looms, also no battery hand is required, and assignments are 6 to 8 looms per weaver and 30 looms per fixer. Automatic looms still are being tried out for the weaving of duck—several constructions of duck are being run on bobbin-changing and on shuttle-changing looms with fair success.

Among loom attachments announced during the last year, one will find an improved picker stick which is made of wood treated with a phenol compound. This process is said to greatly increase the life of the picker stick and to enable it to retain the flexing characteristics of the wood. A rhomboid-shaped picker, made of two plies of durable oak-tanned leather and designed to afford greater contact with the picker stick, is said to insure more economical service and fewer shut-downs for picker adjustment or replacement. Other weave room accessories include a harness tensioning device, a heddle-frame lock stud, a reinforced loom check strap, a steel-spring loom reed, capillary-type bearings, and hydraulic beam trucks designed to handle heavy loom beams in narrow alleys.

Because much of the machinery used in the average cloth room is specially made, it is somewhat difficult to review the progress that is being made in this department. However, in all of the cloth rooms that the writer has visited, a general improvement in lighting has been noticed. Another feature noticed in a number of cloth rooms is the installation of hoists to relieve the operators of much back-breaking lifting.

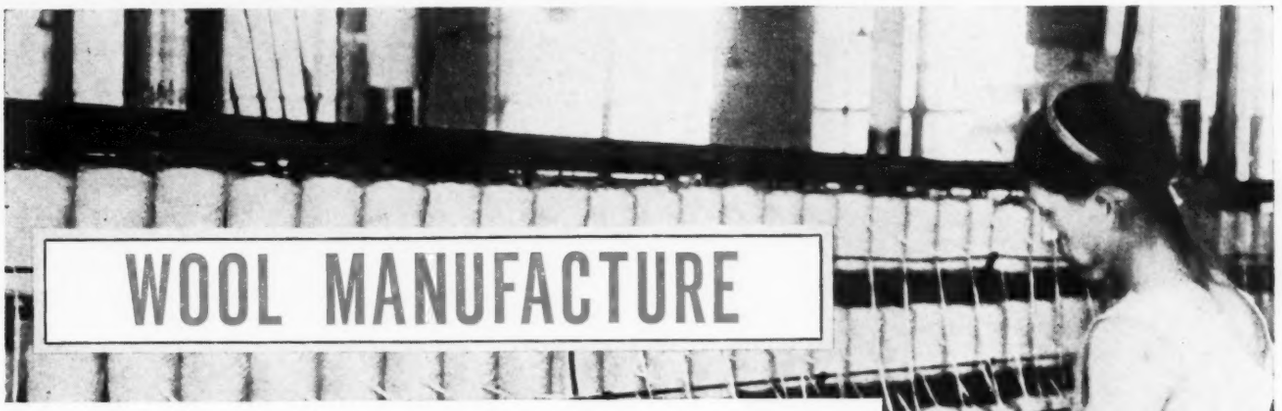
Rayon in Cotton Mills

Cotton mills which have had experience with rayon staple have found that there are certain limitations as to the length and denier of staple that can be run successfully on present cotton machinery. Some mills have eliminated the picking process by supplying staple directly to the card with a feed similar to that used on woolen cards. While this has the advantage of presenting the fiber to the card in a less matted condition, so that less breakage results, the problem of extra space behind the card might possibly offset this advantage. A new method for spinning wool or rayon staple of more than 4 in. in length, on standard cotton machinery, is being introduced. This method is understood to be in use in a few European mills.

Use of filament rayon in the manufacture of certain duck constructions is still being experimented with; however, very special care and handling of the stock are necessary.

Items of more or less general interest include a machine for conditioning filling yarns; a new tail-stock attachment for cork-cot assembling machines; a spindle testing machine for investigating the running characteristics of spindles, flyers, and similar machinery parts; a twist tester which is said to combine extreme simplicity and low price, with ruggedness and precision.

Developments which are not yet commercially available, but which are future possibilities include an electro-magnetic card-stripping device, a compound drafting system for spinning medium and fine yarns from drawing sliver, and spinning spindles for using paper tubes.



WOOL MANUFACTURE

By John C. Lowe
Lowell Textile Institute

IN THE FIELD of woolen and worsted manufacture, general interest in large-package spinning and twisting dominated the 1938 scene. Large-package woolen mules found increasing favor. Biggest opportunities for savings in woolen spinning are in higher spindle speeds and larger bobbins, and these features are now available in mules. Worsted spinning and twisting frames of the ring type, designed to produce large packages at high speeds, were centers of interest in this division of the industry—8-oz. spinning packages and 16-oz. twisting packages, possible on certain counts, indicate the progress in this direction. The year 1938 was also remarkable for the progress made by rayon producers in producing rayon staple fibers with wool-like characteristics.

In wool scouring improved automatic feeds, stainless-steel rakes, improved square lifting motions, simplified arrangements of mechanism and gearing, and settling tanks located under the bowls are found in latest models. For stocks to be spun into worsted yarns, a new method adds oil in the form of a specially prepared cream in the last scouring bowl. It is asserted each fiber receives an evenly distributed film of oil. Fiber breakage in processing is reduced; tear at the comb is increased. Special oils are required, but the potential value of possible noil reduction is enormous.

Yarn Manufacture

Improvements in woolen preparatory and spinning machinery in some cases resulted in 60% reduction in the number of cards, 80% less card waste as compared with older systems, and other similar substantial economies. An automatic system for making woolen blends uses a rotary spreader; it is said to reduce handling and increase production. A recently introduced wool opener of foreign design, which produces from 900 to 1,300 lb. per hr., is said to obtain these productions at approximately half the usual speeds, thus minimizing fiber breakage.

A separator knife for tape condensers and a device for changing the number of ends of roving from tape condensers have been considered favorably by the trade. The same firm which introduced these has also introduced "thread removing" card clothing for use in connection with reworked stocks. This clothing is used on two or more workers of one or more cylinders on woolen cards. It works in two ways, either holding the threads and bits in reworked stock until they are carded out or removing them from the stock, for later stripping.

A card-grinder's setting gage is now available. It allows quick, precision parallel setting of grinding rollers to give a controlled depth of cut.

A new, all-electric woolen mule is available. It has two independent motors, one fitted to the headstock and one set in the carriage to drive the spindles. This motor imparts to the spindles, with gradual changes, the necessary variations in speed during spinning. The backing-off motion is also driven by this motor, dispensing with a differential motion.

Samples of woolen yarn may be produced in a few minutes by means of a set of small machines which have been made available. The set comprises a 9 in. wide picker; a small card; and a small hand mule, the spindles of which are motor driven; 8 oz. of material is enough for a sample yarn.

Use of metallic clothing in worsted yarn manufacture has increased: no stripping, no grinding, and greater production followed by a better yarn are the reasons. A progressive and worthwhile development in worsted carding is the use of a twin burring

arrangement which divides the wool into two "streams" in the forepart of the card. Each stream of wool is treated by two Morel rolls. In this way burry wools are cleared with less fiber waste. Greater production is possible because the feed can be increased. Noil is greater but yield of top is unchanged. Since noil is more valuable than burr waste, savings result.

Wide French combs are finding favor. Simplified mechanisms, greater accessibility to the pinned segments, and provision of a setting dial or index wheel are some of the changes. An improved detaching-roll nip, in which a stationary block of special shape is substituted for the bottom detaching rolls, results in better combing because the roll nip is brought nearer to the top comb, increasing the amount of recombing.

Progress in reduction of number of operations necessary to produce roving is worthy of mention. New sets of drawing embodying latest practices are being tried out in both French and English systems of yarn manufacture. In French drawing, new sets have from four to five operations of intersecting gill boxes. However, since cost prohibits use of all intersecting gill drawing, there is a tendency to introduce very fine ordinary gill boxes for the fifth and sixth operations, the pins being soldered to the extra-thin faller blades.

In the English system of worsted drawing most marked changes are in reduction of number of operations, increased use of intersecting gill boxes, and a trend towards higher drafts. Research indicates intelligent use of intersecting gills will result in further drawing economies.

Twister tubes, condenser tubes, and condenser-control guides set between two sets of drafting rolls indicate that the search for a successful double-drafting spinning frame continues. Of interest is a modified system of cottton spinning which permits the processing of top into yarns. Worsted yarns on the cotton system is a challenge which must be met.

Worsted Spinning

In worsted spinning, changes in design and improvements have been numerous. A recently announced ring frame for English system spinning is of interest. The roll angle is almost vertical, the Scaife motion has been replaced by a new and simpler motion, regular or reverse twist is easily obtainable without changing the tape settings, and included is a system of gearing whereby the proper direction of rotation of the front rolls may be obtained when direction of twist is changed. Easier creeling is assured, large packages are possible at cap-frame speeds, with an increase in production ranging from 12% to 67% over that of small-package cap frames.

Competition to mules in French system yarn manufacture is being offered by improved fine-yarn ring spinning frames featuring inclined spindles, high draft if required, and greater angle of drafting rolls. Spindle speeds up to 9,000 r.p.m. are said to be possible.

Twisting frames have been changed along similar lines. Included are improvements in the delivery and trapping mechanisms; and carborundum covered dolly rolls which give constant grip, eliminate plucking of fibers, and are practically indestructible.

A new yarn-conditioning machine introduces within the body of a yarn a quantity of moisture less than that required to saturate it, but greater than the amount to be retained in the yarn; the excess of moisture is expelled centrifugally; speeds of 4,500 r.p.m. to 5,000 r.p.m. are recommended.

Staple and Staple Blends

Woolen manufacturers and staple fiber combers will be interested in an improved rayon opener which operates on an entirely new principle, no opening being done at the feed rolls. Stock is never held while being worked; opening is obtained in a series of gentle operations inside the machine; this is said to reduce fiber breakage and injury to a minimum. The machine will handle stock 1 to 7 in. in length, either matted or in parallel bunches. Production ranges from 600 to 1,200 lb. per hr.

Processing of wool and staple blends does not seem to have offered great difficulty on either the woolen or the worsted system. Most mills, using their regular equipment, have obtained satisfactory results. Tests indicate that ordinary card clothing is superior to metallic wire for this purpose, and also for processing 100% staple rayon. Combing is considered necessary; either French or Noble comb may be used. Most blends are made in the drawing, but better blends would result if the blend were made at the comb; however, added expense and lower noil value are against this procedure.

Chief difficulty in drawing is experienced when first starting a blend. A five-head, mixing gill box which superimposes the ends from each head should be ideal for such blending. First, third, and fifth heads could handle the wool content; and second and fourth, the staple.

During 1938 numerous improvements were made in various types of looms. A warp beam with adjustable flanges which can readily and quickly be screw-adjusted for exact width of warp is available. In a new let-off motion the fundamental feature is the use of a pair of fluted nip rolls. One or both of the rolls may be covered with rubber or some other resilient material; rolls are positively driven, and sector-shaped lease rods direct warp yarns to the roll nip. The warp beam may be braked by a special lever adjusted by screw and bolt.

Automatic Let-off

An automatic, self-adjusting let-off motion has also been announced. It is stated that no change in the weight is necessary from the beginning of a warp to the end, and that regular loom beams may be used with slight modification. No friction bands or chains are required.

Of interest is an electric warp stop-motion. Also new is a harness-tensioning device, which, it is asserted, not only saves power, but also effects economies in harness supplies. The firm marketing this device also offers an improved harness frame constructed with metal end pieces which act as channels for the wooden frame, giving it rigid support. The construction assures long service and freedom from sagging. Another firm has introduced an all-metal loom reed with a new method of construction. Great flexibility, entire absence of rust and resultant damage due to acid corrosion, and the unique repairability of these reeds make them valuable to the industry.

Picker sticks possessing greater flexibility, thus insuring longer life, are available. An adjustable shuttle binder announced during 1938 is constructed in two parts—a malleable iron outside binder and an adjustable, steel inside binder. With its use banging of looms is eliminated; shuttles last longer; pick on looms can be reduced up to 50%, thus prolonging life of pickers and picker sticks; and creeping of shuttles is prevented. A grain-finish take-up-roll covering made its appearance; uniformity of gage and better oil-resisting properties are said to be assured.

New type looms were run during 1938 at an average speed of 128 picks per min., 80% to 85% efficiency. Four to six looms per wearer were assigned, and a fixer took care of 20 to 24 looms. The loomfixer put in his own warps and, generally, no battery-hand was employed.

In a hot-air slasher which was introduced during the year, heating and drying elements are housed in an insulated chamber; air within the housing is circulated by means of four fans. It is asserted there is a very uniform distribution of the heated air.

RAYON AND SILK

MOST IMPORTANT potentially of all of the developments of the year has been the introduction of new and improved types of synthetic fibers and yarns. Nylon and Vinyon, the truly synthetic fibers described in the October issue of TEXTILE WORLD, have captured the interest of every textile man. An acetate staple with a wool-like crimp has already found many applications. Other developments include a continuous-filament acetate yarn which has certain of the filaments cut at regular intervals throughout the yarn, a discontinuous-filament acetate yarn made by the Perlock process, an abraded-filament acetate yarn, a viscose-process yarn for hosiery, a viscose-process yarn made by a continuous spinning process, a strong staple fiber of the viscose type. Yarns made from glass fibers have been greatly improved and are finding increased application in the manufacture of braids, tapes, filter cloths, and other fabrics.

Compared with the total amount of silk and rayon consumed in 1938, the volume of these new materials was small. In the following review of progress in throwing and weaving, the major emphasis, therefore, has been placed on advances in handling the older types of fibers and yarns. It is certain, however, that during the next year or two the materials mentioned above and other new fibers still in the experimental stage will demand more and more attention from the textile manufacturer.

Throwing Progress

By A. B. Long

Developments in throwing during the last year ranged from an entirely new twister to minor lubrication improvements. Actually, however, most of the devices announced during 1938 were either in the nature of improvements to existing equipment, or open statements concerning developments which had for some time been in the experimental stage. In addition, the third phase of throwing—combination yarns—became considerably more prominent during the year just concluded.

A new twister recently offered not only operates on the "two turns per spindle-revolution" principle but also has an individual motor to drive each spindle. As might be expected, such an innovation is still largely in the development stage. Farther advanced are the double-twister-coner machines. Such equipment is now being offered by no less than three manufacturers, and an attachment for a similar build is being offered by a fourth. Machines of this type are finding acceptance in silk throwing, but are at a disadvantage on high-twist yarns, since they do not lend themselves to two-process spinning, due to the take-up package. To overcome this, one manufacturer offers a traverse head that is interchangeable with the usual flange bobbin traverse. Speeds have reached about 18,000 r.p.m. on silk, and about 15,000 r.p.m. on rayon, although 12,000 r.p.m. is more nearly the general maximum. Bobbin covers and stronger and lighter-running flyers have assisted in making higher speeds possible.

Looking forward to the time when the redrawing operation and use of shipping bobbins will be largely eliminated, one throwing machinery manufacturer placed on the market an up-twister which is designed to put high-twist yarn on a headless package. Another builder announced last year a twister in which large castings replace many parts that previously were bolted together. Attached to the castings are wires for throwing the spindles off the belt when piecing-up ends. A third manufacturer developed for his up-twisters, among other things, a traverse adjustment which operates below the cam instead of above, as is usual. It is said that with this arrangement traverse parts stay in more constant alignment.

Two new twist-setting boxes were

offered in 1938. They operate on constant temperature and moisture principles, much like former models, but have special advantages as to capacities, controls, and adaptations.

Winders

A new skein-winding machine which was installed in several plants last year incorporates a heart-shaped cam, compensated traverse, slow start and stop, speed change gear, and traverse change gare. Also of note in skein winding was the wider use of piston-type traverses, spindle-less attachments, a new changeable-blade cleaner that replaces the traverse-guide porcelain, and several new adjustable swifts. Some of the last-named items were built to accommodate the 1-lb. rayon skeins which were commercially produced last year.

An improved and simplified cone winder received much attention during the last twelve months. This machine has eliminated use of an oil bath, and has lubrication provisions not before seen on such machines. It has a gear gainer drive that is quickly changeable, and an improved full-cone knock-off. Better cleaners are now available.

Although elimination of the redrawing operation is widely predicted, a greatly advanced machine has lately incorporated a substantial adjustable, full-bobbin stop-motion with a compensating unrolling tension that halts the supply bobbin when an end breaks. Also, a stainless steel cleaner is now on the market for mounting on redraw machines. Available also is a cleaner for mounting in place of the traverse guide, as mentioned under winders.

Soaking

It is somewhat ironical that now, when plain rayon crepe cloths are relatively unimportant, better soaking materials for accurate control of pebble have finally been developed. Stable synthetic sizes and sulphonated mineral oils were also developed for this purpose, as well as for eliminating rotting and rancidity.

New penetrants are now offered as soaking-bath assistants. Other silk-soaking aids are three new electrode-type and one new comparison-type pH indicators. For extracting, throwsters can now secure a machine equipped with a timer which automatically throws a hydraulic brake, thus assisting maintenance of uniformity.

The trend in bobbins continues to larger and larger capacities, with the maximum for flanged bobbins used in throwing about 1 lb. of yarn. Less standardization in sizes than ever before is apparent. A new method for locking heads to bobbins without the use of any rivets or drive screws has been adopted by one bobbin manufacturer.

Of interest to all throwsters were the separate unions of two throwing machinery concerns with two large textile equipment builders who formerly had not particularly catered to the throwing field.

Less tangible but nevertheless important is an increasing interest in costing and motion studies of throwing operations. Both phases are reaching higher degrees of perfection in the more progressive concerns and are, whether the fact is fully realized or not, essential for continued progress.

Future machinery developments will undoubtedly include more productive equipment due to increased speeds, larger and better-balanced packages, and elimination or combining of processes.

Weaving Developments

By H. E. Wenrich

New developments in the warp preparation and weaving of rayons and silks include a new short-traverse winder for warper cones; its purpose is to decrease end breakage when running fine yarns. Used either with wood or paper cones, the short traverse allows greater distance between the cone nose and creel tension, thus eliminating yarn drag over the cone end.

A new yarn-drag device for warping creels, which tensions on a pneumatic-differential principle, insures uniform tensioning of any type or size of yarn without the necessity of resetting. Made from special hardened china, the device has great resistance to wear, and therefore requirs less frequent replacement.

In the warp-sizing department, several improvements are commendable. A new seven-cylinder sizer has the same drying area as former nine-cylinder models; in addition, stretch control is instant and positive. Drives of the new sizers are equipped with micrometer reading dials which give information regarding percentage of stretch at any moment. A heavier take-up drive is provided for sizing at higher speeds.

A new size level controller can be set to operate on a change in level of from ¼ in. up to several inches. Operating without time-lag, it maintains constant size level, regardless of slasher speeds or stops. It can be mounted on any type of machine.

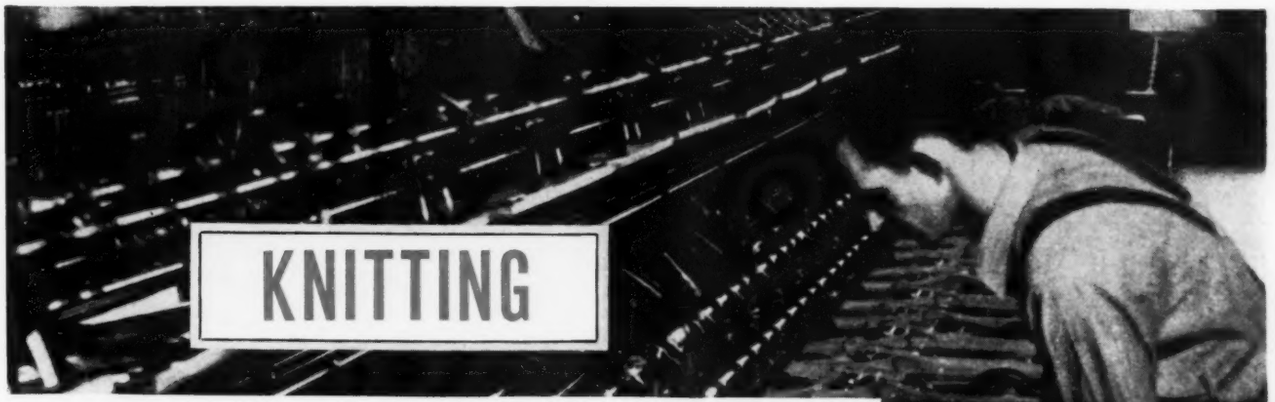
Mills engaged in warp sizing will be interested in the reports of research work on this subject, carried on under auspices of the United States Institute for Textile Research, which are now being released.

In the quilling department, an important development was a new rayon and silk bobbin stripper. In the past, quiller hands damaged quills by cutting and rubbing off waste yarn. This practice is eliminated by use of the new stripper, which is capable of cleaning up to 100 quills per min. without damage to the smooth, varnished surface of the wood or paper. Perfect quills help produce quality cloth; and mechanical waste stripping keeps the quills in better condition. Flat paper bobbins reputed to be superior due to high resistance to splintering, chipping, and splitting are now available for use in looms designed to operate with flat quills. The quills are said to be impervious to moisture; and the smooth, resilient, corrugated surface allows the weaving of delicate yarns, as well as hard-twist yarns.

In the weave shed, an improved harness frame introduced during 1938 prevents sagging and takes more rough punishment; a new harness-frame lock-stud keeps rods securely in place by a spring mechanism; and a new harness pull-down tensioning device gives smoother loom operation. Other improvements include a grain-finish rubber covering for take-up rolls, said to have better oil-resisting properties; a "floating" check strap conforming to the angle of the picker stick and cutting down replacement parts needed; an oilless-bearing rawhide picker which, it is asserted, eliminates fitting; a treated picker stick, for which is claimed considerably longer wear; two adjustable shuttle-binders constructed with malleable iron outside binders and adjustable steel inside binders—one makes use of a single adjusting bolt in center position while the other uses two bolts offset from center; advantages cited include adjustability while in place and elimination of shuttle creep on 4x1 and 4x4 looms.

High Efficiency Obtained

Interesting also is the high efficiency attained during the last year by latest model silk and rayon looms. On the 2x1 model better than 90% efficiency has been achieved; weavers have handled up to 24 looms; fixers up to 60 looms, depending upon the fabric being woven; and speeds as high as 150 picks per min. have been attained, although it should be understood that loom builders do not recommend operation at speeds so high as this.



KNITTING

THAT THE knitting industry is on the verge of some fundamental and far-reaching changes in technique is apparent to anyone who has followed closely the developments of the last year. First, there is the announcement of new types of synthetic yarns—such as Nylon and Vinyon—which, when commercially available, are expected to find extensive use in manufacture of full-fashioned hosiery and other knit goods. Second, rapidly emerging from the experimental stage are new machines—such as a device which permits production of combination knitted-woven fabrics—that are believed to have great potential importance. Of the machinery developments which have already reached the commercial stage, the most outstanding, perhaps, are those having to do with full-fashioned hosiery equipment. In addition, there has been introduced a variety of new and improved machines for use in manufacture of seamless hosiery and flat-knit and circular underwear and outerwear fabrics.

For some time there has been a definite trend toward making full-fashioned hosiery machines more completely automatic in operation. Announced early in 1938 and mentioned briefly in last year's review was an automatic welt device which permits setting up of the initial courses and turning of the welts to be carried out without stopping the knitting machine and without requiring any skill or laborious effort on the part of the operator. The device is designed for application either to new machines or to those already in operation, with the exception that it will not be built for machines coarser than 42-gage. Use of the welt device is said to increase legger productivity by 20 to 25%.

At the Knitting Arts Exhibition, held last April, another automatic welt turner was shown, which is said to produce welts exactly the same in appearance as those turned by hand. The welt turner is applied to a single-unit machine having an operating speed of 73 to 75 courses per minute. This machine has recently been further improved by the incorporation of an a-c. adjustable-speed motor drive designed to furnish a high starting torque at all required speeds. The drive is provided with six separate speeds which in themselves are adjustable.

A patent covering a completely automatic full-fashioned hosiery machine was granted during the year, but officials of the company to which the patent was assigned state that they have no immediate plans for putting such a machine on the market. The specification, incidentally, was the most voluminous in the history of the U. S. Patent office, covering 316 pages and comprising 346 illustrations and 250 claims.

Production of single-unit stockings on conventional leggers is made possible by use of a new high-speed heeler. By means of special attachments, uninterrupted knitting of the leg and foot is carried out on the legger, after which, by means of a topping stand, the blank is transferred to the heeler which knits the lower heel. The heeler is designed for making reinforced heels, plated heels, and the heel-within-a-heel type.

Fancy welts can be made on a machine to be used with single-unit, single-head, full-fashioned hosiery machines. One welt machine will supply three or four single-unit machines. In addition to making the pattern, the machine also puts the gage and yarn size in the welt. An innovation in the single-head, single-unit type of machine is a new model for producing men's full-fashioned half hose. An entirely new type of jacquard single-unit machine is designed to produce open-work and press patterns simultaneously.

Announced last year was an improved half-speed shock absorber, which makes it possible to run full-fashioned machines at a greater speed than has heretofore been possible, and at the same time eliminates car-

rier vibration. Another new attachment for full-fashioned machines consists of a drum type friction, by means of which friction is concentrated in one place, thereby allowing the machine to run at full speed during all operations.

Accurate setting of jack beds, slurcocks, and verge plates, and proper alignment of needles, needle-bars, catch bars, and other parts are facilitated by a recently introduced dial gage. Sinker breakage and wear can be reduced by employing new rivetless sinkers with welded, hardened butts and throats.

For modernizing older types of equipment a method has been developed for converting 18-section leggers into 24-section machines, and another method devised for converting 20-section footers into 40-section machines.

The close of the year saw the invalidation by the highest courts of the Kaufman ringless hosiery patent, thus terminating litigation.

Circular Hosiery

Increased demand for elastic-top half hose and socks has stimulated development of several new machines for production of this type of hosiery. With one new machine, for example, elastic yarn can be knit in small-size hosiery tops with definite stitch structure like the main yarns of the fabric. The elastic yarn is incorporated at an auxiliary feed and is knit independently of the main yarn incorporated at the regular feed; due to the way it is knit, the elastic yarn is short of its full stretch even after the fabric has been stretched to the breaking point; both plain and pattern tops can be knit with the use of the elastic-top machine. Again, slack-length, elastic-rib-top socks can be knit on full-automatic half-hose machines by employing a recently developed laying-in attachment which interlaces the rubber with the rib. It is a simple matter to change machines from knitting rubber-top slack socks, by means of this attachment, to regular half hose without rubber.

During the year, one manufacturer brought out a true-rib self-topping half-hose machine with a reverse-plating attachment and a double-sole trimmer which trims the sole while the sock is being knit. Jacquard machines for knitting children's hose, the first to be built in this country, were introduced to the trade. Also, the year saw the introduction of a new, imported jacquard rib machine for children's hose. To simplify changing of striped patterns, a jacquard machine has been equipped with a chain striping control. Other developments of the year are a coarse-gage machine with chain striper and seven fingers provided with individual yarn clamp and cutter, and a chain type striper with special control for changing two facing or backing yarns at the same time.

Among improved small ribbers is an automatic selvage welt striping machine with a cutter between the cylinder and dial, which operates for two stitches during the process of knitting the selvage welt. A manufacturer of loopers brought out an improved coarse-gage automatic machine.

Revived interest in run-resistant circular hosiery has been apparent during the year.

Underwear and Outerwear

Of particular interest to underwear manufacturers is a circular machine for knitting elastic girdle material with selvage edge, and having an auxiliary laying-in attachment for knitting-in an extra end of elastic to produce a heavier, stronger, and more durable fabric.

Yarn is fed to the needles of a new 16-feed ribbed-underwear machine under even tension; and tension of the cloth and backlash are prevented by a gear-driven dial. With this machine double production is said to be possible, as compared with an 8-feed machine, while only 36% more power, 30% more capital investment, and no more floor space are required.

Supplying of rayon on section beams by the rayon producer has been made possible by redesigning of a high-speed tricot machine so that it will take sectional warp beams up to 14 in. in diameter. The machine has a normal operating speed of 360 to 400 r.p.m. and will produce from 9 to 10 lb. of single-bar fabric per hour from 100-denier rayon.

Among new machines for knitting outerwear is a spring-needle machine for knitting heavy backed fabrics, equipped with overhead drive, refined take-up adjustments, and a brake attached to the driveshaft to prevent backlash. Men's and boy's jacquard-design sweaters of worsted plated over cotton can be knit in individual sizes on a 14-in., six-cut, high-speed plain baby shaker machine capable of knitting a 2x2 rib bottom on the cylinder needles, then transferring automatically to the dial needles to knit jersey. A new three-needle-rack latch-needle machine with three-color striping and special draw thread attachments, and a concealed head, knits cuts or complete sweaters, in both half-cardigan and double-tuck stitch.

Other interesting circular machines include a 7-in. two-feed automatic rib toque machine with a revolving cutter for controlling a multiple number of ends by pulling the ends away from the needles; a 30-in. 12-feed rotary jacquard with short chain system for easy control of feeds; an automatic individually controlled-feed striped jersey machine with cutters and clamps for the elimination of waste on each of its 32 feeds; an 18-in. machine with 24 pattern wheels; a machine with four pattern wheels for knitting elastic-backed bathing-suit material with irregular pattern effects. Bathing suit straps and similar articles are made from ¾-in. tubing knit on a circular machine brought out several months ago. New also is a high-speed back-drive glove-fingering machine.

Flat machines of interest include a hand machine with double jacquard and two sets of jacks, and a links-and-links automatic machine with stop motion and motor attached; both machines have individual needle control for producing distinctly pronounced designs. A full-automatic double-lock links-and-links machine is equipped with a jacquard operating on four rows of selectors to effect absolute individual control; racking is selective of from one to eight needles; i.e., any number of needles up to 8 can be racked in one operation, either to the right or to the left.

Stop- and protecting-motions of several types have been brought out. One is a small, compact needle-protector device placed in a position so that its pointer is close to the knitting needles; and when a bunch-up occurs at the needles, the pointer is deflected, and the machine stopped by electrical contact, thus preventing smash-ups and broken needles. Another, a small device to be placed in contact with the needles of spring-needle machines, stops the machine by electrical contact the moment a bent or broken needle touches it. A stop motion for circular machines is attachable without drilling and obviates use of a threading stick. An electro-magnetic stop motion for spring-needle machines operates by means of a relay and solenoid.

Improvements in a weaving loom have increased its speed and enable it to knit an extremely small mesh. Sewing machines used in the knitting industry have undergone considerable refinement, and a number of new special-purpose models brought out.

Two recent developments not mentioned above which are worth watching during the present year are a machine for producing knitted yarn and a special viscose process yarn for hosiery. Finally should be noted a growing feeling among knitters that household and industrial fields offer the largest opportunities for increased sales of knit goods; as a result, a number of knitters are endeavoring to develop products for those markets.

TWO YEARS ago in his review of technical advances in the processing divisions of the textile industry, the writer recorded the phenomenal growth in 1936 of five new types of finishes—the crease-resisting finish, the water-repellent finish, the transparent finish, the mothproof finish, and the permanent finish. It was apparent that the old types of finishes which merely gave a temporary enhancement to the appearance of fabric, and which disappeared at the first laundering, were doomed. Taking their places were what might be called "functional finishes." In 1937 and again in 1938 this trend toward functional finishes became more and more pronounced, and a wide variety of new chemicals and processes for producing such finishes reached the commercial stage of development.

The term "functional finish" can be defined as "a finish which renders a yarn or fabric more suitable for a specific use or uses." Depending on the use to which the fabric is to be put, the functional finish may enhance the appearance of the goods, increase their utility, or both. Examples of the better-known and more widely used functional finishes which have come into prominence in recent years are shrink-proof finishes, waterproof and water-repellent finishes, crease-resistant finishes, flame-proof finishes, mothproof finishes, and various types of permanent finishes.

Most of the functional finishes which have been developed within the last year or two are applied chiefly to cottons and rayons. A notable exception is the sulphuryl chloride treatment for rendering wool unshrinkable, first brought out in England and now just beginning to be employed in this country in the production of non-shrinkable blankets and athletic socks. Two other processes for making wool unshrinkable by treatment with tertiary amyl or butyl hypochlorite have been patented by American chemists, but are not yet being used commercially.

Synthetic resins continue to gain in favor for producing a greater and greater variety of finishes. Thus, urea formaldehyde resins—originally employed in the textile industry for imparting a crease-resistant finish to cotton and rayon fabrics—are now used to give various effects ranging from a soft to a stiff, wiry finish. Another application of the urea formaldehyde resins, as well as the acrylate resins, is in the production of "stabilized finishes" of various types. Stabilized finishes (which can be considered as one class of functional finishes) include non-slip and non-sag finishes on rayon; non-shrink finishes on marquisettes; and non-stretch finishes on denims and other cotton fabrics.

Certain of the acrylate resins have the property also of imparting a full and bulky finish to various fabrics. Still another application is for producing an abrasion-resisting finish to shoe ducks and other cotton fabrics which are subjected to rubbing during wear. An important use of synthetic resins is for producing a wool-like finish on spun-rayon fabrics. Many of the finishes obtained with the synthetic resins are resistant to repeated launderings and/or dry cleanings, and can be classed as permanent or semi-permanent finishes. Resins of a third type—the vinyl resins—are finding increased application in processing silk and rayon piece goods to obtain transparent, waterproof finishes.

Permanent and semi-permanent finishes of various types are being produced in increasing quantities by means of cellulose esters and cellulose ethers. These compounds are used, for example, in producing full, clothy finishes on sheetings and other cotton fabrics, and, to a more limited extent, for obtaining special finishes on spun-rayon materials.

On cottons and rayons soft finishes which are resistant to washing and dry cleaning are obtained by use of recently developed substantive, cation-active compounds. Other examples of functional finishes include germ-

resistant finishes, which likewise have the property of counteracting perspiration odors; and special finishes which, by removing the fuzz or hairs that clog the pores, ventilate the fabric and facilitate evaporation of perspiration. Announcement was made in England of a new process for producing a metallic finish on fabrics by treating the goods in a solution of tri-alkyl phosphineaurous halide; this process is said to result in the depositing on the fabric of a thin film of gold. Whether or not it ever becomes commercially important, this metallic finish is a good illustration of a functional finish which has as its chief purpose the improvement of the appearance, rather than the utility, of a textile.

The growing appreciation among textile men of the important part played by the finish in assuring customer satisfaction with the fabric is evidenced by the fact that at least three separate research projects are now under way dealing with the evaluation of finishes.

Dyes and Chemicals

Aside from the development of new finishes and finishing procedures, the most notable innovation in textile processing during the period under review has been the adoption by several printers of a new method of printing making use of a class of colors which differs materially from those formerly employed. These colors consist essentially of insoluble pigments of fine particle size uniformly dispersed in a vehicle in the form of a thin paste in which are incorporated carefully selected water-soluble binders. Printing is carried out on a roller printing machine, after which the goods are dried and then are cured by subjecting them momentarily to an elevated temperature in an air dryer, on a tenter frame, or with other suitable equipment. No further aftertreatment is necessary. Thus far these colors have been employed primarily on shirtings, but their use is extending to other types of fabrics.

To a large extent improvement of old processes and development of new ones in the textile industry is linked with the development of new chemicals and dyes. In addition to the new finishing compounds and the new class of printing colors previously mentioned, there are several other products which appear to be of particular interest. The number and variety of surface-active chemicals continues to grow at a rapid pace; and types are now available which are suitable for practically every wet-finishing operation which calls for the use of a wetting agent, penetrant, or detergent. One new compound announced recently differs entirely in its chemical composition from those previously on the market; combining excellent detergent, penetrating, and wetting-out properties, it is expected to prove advantageous in processes where the older types of surface-active chemicals cannot be used at all or where, because of adverse conditions, they do not function at their highest efficiency. In addition to this and other surface-active chemicals, there have been brought out a large number of textile auxiliaries, including coning oils, silk and rayon soaking compounds, fiber lubricants, water-repellents, flame-retardants, anti-foaming agents, and an oxidizing compound for use in developing vat colors.

Of particular interest among the new dyes introduced during the last twelve months is a new series of colors for printing on cotton and rayon. These dyes are water-soluble and can be fixed by a short steaming followed by a treatment in a dilute caustic soda bath to give prints of good all-round fastness. Padded shades are dischargeable to a clear white; the colors can be used with aniline black or with regular vat printing pastes, and can be combined with one another to produce compound shades.

Machinery Developments

Among the developments in bleaching, dyeing, and finishing equipment are several new machines which reflect the uninterrupted trend toward continuous or range processing of cotton, rayon, and wool fabrics. Thus, there is a new open-width washer designed to run in tandem with, and at the delivery end of, the progressive jig mentioned in last year's review. Other examples include a full-width conveyor-type machine for boiling-off, scouring, chemicking, and other operations; a continuous piece goods carbonizing machine handling 800 to 900 lb. per hour; a double-slot vacuum extractor; a new type of squeeze roll which can be used as a separate unit or in combination with continuous washers, carbonizers, or other equipment; a raising brush for shears said to eliminate the problem of ridges on surfaces of fabrics.

During the last year two new stainless steel piece dye kettles have been introduced, one a totally inclosed model which is said to give a 25 to 35% steam saving over open kettles. Likewise, two stainless steel stock dyeing machines were announced; a novel feature of one of these is that the main kettle and expansion tank are fabricated as a single unit, eliminating all outside pipes, valves, fittings, etc., except those required to bring steam and water to, and remove drainage from, the machine. Introduced at the Knitting Arts Exhibition last spring was a rotary-type hosiery dyeing machine fitted with a floating, rotary cylinder designed to insure uniform penetration of the dye liquor at all points and to eliminate tangling, chafing, and streaks. For steaming and conditioning all types of yarns a machine having a capacity of 500 lb. was developed. A new cloth conditioner which operates at a cloth speed of 30 yd. per min. on worsted fabrics requires less than 35 ft. of floor space.

Other Equipment

Three machines brought out by one company are a doubler designed to take all widths of goods up to 84 in. with a tacking head operating at 25 yd. per min. and equipped with draw rolls and folder; a motor-driven inspecting machine designed to handle cloth from a roll to a roll and fitted with forward and reverse drive and patented knee control; and an improved butt-seam railway sewing machine.

A novel device is a photo-electric seam detector for calenders; this includes a magnetic switch operating the valve which removes pressure from the calender roll. Other new equipment includes a high-speed traverse plaiter; a changeable-contour hosiery drying form; a pillowcase doffer; and a mechanical folder for towels, napkins, pillowcases, and other articles. Several important improvements have been made in machines for drying rayon in cake, skein, or cut staple form. The cloth-straightening control for eliminating bowed filling from cotton and rayon fabrics has undergone considerable refinement, and a number of finishers have made trial installations of this equipment.

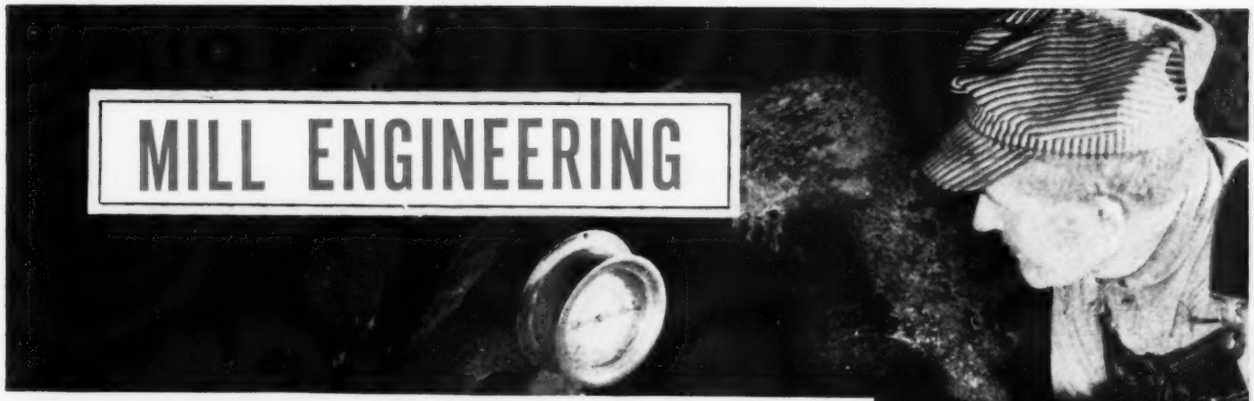
No attempt has been made in this brief review to list every new dye, chemical, and machine which has been brought out in the last year. Rather the aim has been to depict the broader trends in the finishing industry. It is interesting to note in this connection that while efforts to reduce costs have not been relaxed, the major emphasis has been on the improvement of products.

Guide to Consumption of Domestic Coal-tar Dyes as Shown By Annual Sales Figures

Year	Lb.
1929	106,071,000
1930	89,972,000
1931	85,220,000
1932	73,591,000
1933	98,229,000
1934	84,309,000
1935	97,826,000
1936	117,000,000
1937	118,046,000
1938*	97,000,000

* Textile World Estimate.

MILL ENGINEERING



AT THE ANNUAL meeting of the American Society of Mechanical Engineers, held last December in New York, the statement was made that, while in the past industrial plants generally speaking had lagged behind utility stations in progress in the generation of power, such is not now the case. Industrial plants are becoming intensely interested in the most modern types of steam- and power-generating apparatus. That textile mills are no exception is shown by the high-pressure boilers and turbines, some of the superposed or topping type, which are in operation or are now being installed. The power plant is not the only part of the mill which is being benefited by this desire of management to take advantage of the latest developments in engineering. Throughout the mill we find that motors, lighting equipment, automatic controls, air and stock conditioning systems, etc., are being modernized.

Pulverized Fuel

Use of pulverized fuel is increasing rapidly, and the latest development along this line is the combination oil- and pulverized-fuel-burning furnace. Either oil or pulverized coal can be burned, and the change from one to the other can be made almost instantly. This change may be desirable or necessary for one or more of several reasons, such as a low price of oil as compared to coal, breakdown of the pulverizing equipment which makes an instant change necessary, necessity of operating at light loads that can be more easily carried with oil than with pulverized coal, etc. In some types of pulverized-fuel burners, where the amount of primary air admitted with the coal is large relative to the total air, it is not possible to introduce sufficient air through the secondary air registers to support combustion when burning oil. On the other hand, in those types of pulverized-fuel burners where the percentage of primary air is small, the register vanes admitting the secondary air can be quickly adjusted to permit the satisfactory burning of oil.

With the increased use of high-pressure, high-temperature boilers burning pulverized coal, the plant engineer finds that he has to consider some additional factors to which he had previously never given thought. For example, on the fuel end he must post himself on the grindability factor of the coal that he is given to burn. As the grindability decreases, the power to operate the pulverizer increases and the passing capacity of the mill per hour decreases.

Again, the engineer must give attention to the ash fusion point of the coal, since on that depends the amount of slagging on the furnace walls. A certain amount of slagging is desirable, since it yields a hotter furnace with less danger of the flame being extinguished, particularly on light loads. On the other hand, if the water-cooled walls are too heavily slagged, then the proper amount of heat will not be absorbed in the furnace from the gases and they will be too hot when they pass into the superheater zone. Also, he must consider the fly ash problem. In some cases it may be necessary to install equipment to remove this material from the flue gases before they enter the stack. Considerable research work is being carried on to determine if some profitable use can be made of fly ash.

On the boiler end the engineer will encounter more complex feed-water purification problems than he has known previously. He must be absolutely sure that there is not even the slightest trace of oxygen in the feed water, the pH value becomes important, and complete prevention of scale formation inside the boiler becomes imperative. With the resultant high temperature of the high-pressure, highly superheated steam, come new problems of expansion and contraction, of the proper metals for use in valve seats and disks, and of desuperheating.

At the A.S.M.E. meeting mentioned above a paper was presented relative

to drum head cracks that had appeared in recently installed high-pressure boilers. These cracks appeared in the drum heads around the opening where the feedwater entered. In each case it was found that the metal of the head formed part of the feedwater inlet connection and that the feed water was in actual contact with the metal of the drum head. When the feed water was passing into the boiler, the temperature of the part of the metal immediately in contact with the water approximated that of the water, 250 to 350°F.; but when the feed stopped, as it did periodically, the temperature of the water in contact with the metal, and consequently the metal itself, rose to that of the boiler water, 587° F. The repeated stresses set up by these frequent changes in temperature accelerated corrosion, and the cracking was attributed to a corrosion-fatigue. The cracking was stopped by installing a through pipe in the head, so that the feed water as it passed into the boiler through the drum head did not come in contact with the metal of the head. The latter would, therefore, always be at a constant temperature corresponding to that of the boiler water.

A notable advance in the adaptation of low-grade fuels to modern steam-generating equipment is the successful construction and operation in North Dakota of a 650-lb. boiler burning for fuel a 6,300-B.t.u. Dakota lignite containing 38% moisture. At 300 to 400% rating this boiler showed 80 to 82% efficiency. The unit is complete with stoker, economizer, air heater, water-cooled furnace, and superheater.

Centrifugal pump manufacturers are now offering motor-pump combinations in which the pump and motor are on a common shaft with no coupling between the motor and pump and no outboard pump bearing. These combinations are particularly applicable where small sizes are required. They are available, however, in capacities up to 1,000 gal. per min. Their advantages include small floor space required, simplicity of construction, fewer bearings, and much lower cost. Multi-stage pumps are now obtainable without outside thrust bearings. A small metal bushing located midway on the shaft of the pump insures positive dynamic and hydraulic balance in even or odd number of stages.

Motors and Controls

In the field of motor applications we find an increased use of explosion-proof, of splash-proof, of geared end, and of variable-speed brush-shifting types of motors. A novel application of a mechanical-drive turbine and a range drive was made in a print works. A 50-hp. non-condensing turbine drives a 20-kw. 600-volt, 60-cycle generator which supplies power to small motors driving the soaper, mangle, scutcher, and swing. The dry can is driven direct from the extended shaft of the generator and the exhaust steam from the turbine supplies the heat for the cans.

A mercury-button limit switch was developed for use on spinning frames. When used in connection with filling-wind, it limits the amount of yarn that can be wound on the bobbins, thus reducing the necessity for stopping the frame, before bobbins are actually full, in order to maintain doffing schedule. The switch is mounted underneath the roller beam, and an arm of the switch contacts the ring rail when the latter has reached the position corresponding to a full bobbin.

A new and novel form of insulation for windings of motors exposed to high temperatures is a fiber-glass tape, which is used in place of asbestos. It takes up less space than the latter and its dielectric power is greater.

Endless Conveyor Belts

How many times have power plant engineers wished that their coal conveyor belts were endless? At last this is possible. Portable vulcanizing equipment is now available from the rubber-belt manufacturers; this equipment can be brought to the plant and the ends of the conveyor belt welded together, thus eliminating the use of metal clamps and prolonging the life of the belt and of the rubber covers that are generally used as lagging on the belt drums.

Use of multiple V-belts has increased remarkably in the last few years. One trouble which frequently developed was the tendency for one or more of the belts of a drive to slacken more than the other belts, and thus not carry its share of the load; or perhaps one of the belts would be tighter than the others, and thus would carry the bulk of the load. This uneven length can now be avoided by the purchase of "matched belts" where all the belts in a set have been matched for length and tension.

Synthetic rubber-like materials are finding an ever-widening field of use in engineering work. These materials are resistant to the action of oil, heat, and sunlight. Indicative of the varied uses to which the new materials can be put are tank linings, conveyor and drive belting, packing, motor mountings, cable coverings, and diaphragms.

Oxy-Acetylene Process Work

Progress in the development of oxy-acetylene process work in 1938 has been perhaps the most marked in all the history of this phase of engineering. This applies not alone to regular welding and cutting work, but to other and newer fields for the use of oxy-acetylene equipment.

Among the various new applications noted is stack-cutting, where, for instance, a number of metal plates piled one on another in a stack can be cut to any desired shape, the torch being guided by a template. In welding there is the multi-flame tip, with which as many as seven flames are used in multiple. Other new applications include flame-hardening, where, by the use of the multi-flame tip, the surfaces of calender or other types of rolls can be hardened; flame-softening, where undesirable hardness can be removed from steels; deseaming work, whereby surface defects can be removed from steels; and hard-facing work, whereby surfaces can be faced with hard alloys in order to resist wear.

Lighting

By far the most important development of the year in lighting is the introduction of the fluorescent lamp. The inside of the lamp tube is coated with a special high-efficiency fluorescent material, the exact nature depending upon the color of illumination desired. The discharge is very rich in ultra-violet waves, and, as these waves are radiated from the cathodes at each end of the tube, they are transformed by the fluorescent coating into visible light. The heat radiated is low and the lumens per watt are high, thus making the lamp of high efficiency. The lamp is tubular in form and is available in lengths of 18, 24, 36, and 48 in. The type of fluorescent lamp most applicable for textile use is one which is said to produce the nearest approach to natural daylight ever achieved directly at such high efficiency.

The photo-electric eye has found a new use in textile mills for relieving the pressure on calender rolls as the seam passes through. The electric eye detects the seam as it approaches the rolls and energizes the device that relieves the pressure. There is no reason why the same idea cannot be applied to lifting the cylinder knife of a worsted shear as the seam passes.

A year ago the writer predicted that 1938 would see a marked increase in the adoption by textile mills of the latest types of power and engineering equipment. He predicts that in 1939 an even greater interest will be shown in these matters, and this interest will be followed by purchases and installations, because the investments of 1938 have proved to be highly profitable by reason of the reductions in manufacturing costs which have resulted therefrom.

Textile Upturn Should Continue

ECONOMIC SURVEY SHOWS MARKETS HOPEFUL, BUT CAUTIOUS

Cottons Slow in 1938; Outlook Fair

ACTIVITY in the cotton-textile industry during 1938 somewhat resembled a reverse curve of the 1937 activity. But there were no extreme rises and falls which made the previous year so exciting. Instead, a gradual pickup in activity toward the end of the period followed months of stagnation, which trend observers considered much sounder than the sharp breaks of 1937. The most disheartening feature of 1938's performance was the lethargy of prices in most lines despite a fairly large volume of business. This was reflected painfully in narrow manufacturing margins.

Nearly all observers look for fair business during the first six months of 1939. But few venture to make predictions beyond the halfway mark, and all qualify their remarks with "barring unforeseen developments."

All of the regular indices of activity for 1938 were considerably below 1937. Encouraging developments of the year, however, were elimination of the third shift by print-cloth mills and other efforts toward inventory control, constructive attitude of the Wage-Hour Administrator, stabilization of wages and hours, peaceful labor relations and general improvement in business. Adverse factors were the political uncertainty in Europe, general dissatisfaction with Administration policies, overproduction in some lines and the Government loan program on cotton.

Monthly cotton consumption in the United States in 1938 averaged over 491,500 bales, 21% less than the 618,000 bale average of the previous year, but much nearer the normal consumption of the last ten years. The peak was reached in November with 596,000 bales, and the low in April with 413,000 bales.

Average monthly prices of raw cotton, based on the behavior of New York spots, fluctuated within a range of considerably less than 1c., as compared with the 7.46 spread of the previous year. Low was in the spring months when the average dropped to 8.4c., whereas high came in the fall with 9.1c. Monthly average was 8.73c., as compared with 11.45c. in 1937 and 12.07c. in 1936. Ginnings from the 1938 crop prior to Jan. 16, 1939, totaled 11,558,369 bales, as compared with 17,664,208 bales from the record crop of 1937. Despite the shorter crop, the raw cotton situation was extremely unsatisfactory during 1938 because of the surplus held by the Government under loan arrangements. This surplus exceeded 10,000,000 bales by the end of the year, and tended to depress the futures price below the spot price with obvious bad effects.

Spindle activity by months, corresponding to fluctuations in cotton consumption, was at an average of 70.5% capacity, as compared with 127.5% the year before. However, the difference in operations was not quite so marked as these figures seem to indicate, since the 1937 calculation was based on single-shift operation and the 1938 figure on two 40-hr. shifts. Average hours of operation per spindle in place during 1938 were 240, as compared with 294 in 1937, a decrease of 54 hr. or 19%. There was an average of 22,040,000 active spindles per month in place last year, as compared with 24,081,000 in 1937, a decrease of 9%.

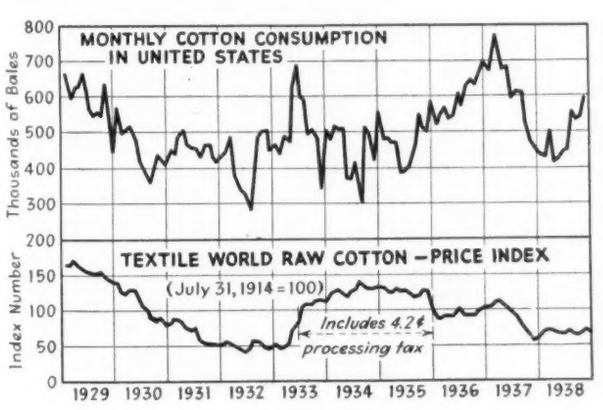
Average monthly prices of print cloths, narrow sheetings and ordinary gray goods were generally low, fluctuating within a narrow range. For example, 64x60, 5.35 print cloth averaged only slightly more than 4½c. for the year, as compared with 6½c. in 1937. High was less than 5c. during 1938, whereas prices touched 8⅛c. during the previous period. Cotton yarn prices moved within a narrow range during the year.

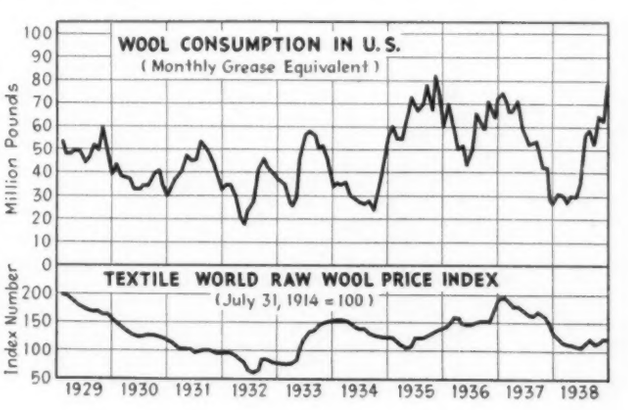
Cotton mills in general found the going hard and unprofitable during 1938 and a great many of them reported losses for the period. This is borne out by TEXTILE WORLD's carded fabric margin index which ranged from 14.4c. to 16.5c. Carded yarn margin varied from 12.7 to 15.6c. In 1937 the fabric margin reached a high of 28.8c. and yarn touched 22.6c.

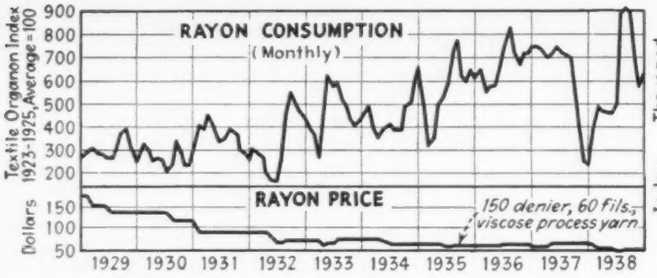
Wool Goods Make Slow Gains

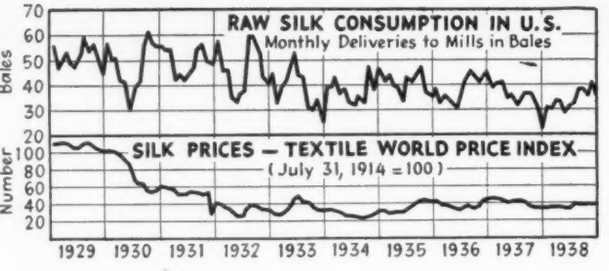
WOOL GOODS manufacturers are in a mood of cautious hope for 1939, based in part on the fact that an unusually disheartening year is behind them; the two-year cycle has a powerful grip on this field. The upturn actually began six months ago so far as price, wool consumption and machinery activity figures go; but it must run considerably farther to make a satisfactory impress on mill profits.

Many annoyances snapped at the ankles of wool-textile men through






RAYON CONSUMPTION
(Monthly)
Textile Organon Index 1923-1925 Average = 100
RAYON PRICE
150 denier, 60 fils, viscose process yarn
Dollars
1929 1930 1931 1932 1933 1934 1935 1936 1937 1938


RAW SILK CONSUMPTION IN U.S.
Monthly Deliveries to Mills in Bales
Thousand Bales
SILK PRICES — TEXTILE WORLD PRICE INDEX
(July 31, 1914 = 100)
Index Number
1929 1930 1931 1932 1933 1934 1935 1936 1937 1938

the year, including U.K. reciprocal tariff agreement and the F.T.C.'s wool-content labelling program; not to mention the Congressional investigation of wool marketing, the abnormal dullness of the first half of 1938, the inventory losses of that same period, the September hurricane and the slow recovery of prices.

The U.K. agreement and F.T.C. labelling took many wool executives from their primary jobs and made them spend everlasting hours in Washington. The industry did an exceptionally fine job at these hearings and even though partially futile for immediate results, left the record clear and compelling. The U.K. agreement as enacted cuts ad valorem rates on wool goods by as much as 40%, and offers a menace to the finer end of the American industry. The fiber-identification labeling plans which involved the old, and the industry had hoped exploded, theory of reworked and virgin wool distinction, have not been settled.

There were few new styles to lead the industry in 1938, but development of covert effects for men's suitings and of numerous diverse items of a sport and semi-sport nature for women's wear, suggests a broader path of style interest for 1939.

Entry of spun-rayon into the field received further recognition in 1938, but old line wool houses regarded their wool-staple mixtures as stepchildren and did little to push them. In the women's wear branch attractive fabrics wholly of staple rayon, treated in the wool manner, are entering the garment field through channels outside the wool industry and the same may be said for men's tropicals. The situation is one for the trade to watch carefully in 1939 lest garment makers come too strongly to count on new sources for fabrics.

Although average weekly sales of wool-textiles in 1938 were slightly (about 6%) above 1937, the yardage of fabric shipped was 25% less (based on first nine months). The relation indicates an increase in the backlog of unfilled orders. Sales were far sub-normal in the first six months, but rose to peaks in July and October, the first chiefly women's wear, the second chiefly men's wear. Total billings for the year in women's wear compare favorably with 1937, but on men's wear they were considerably less. Fabric prices eased in March after the fall opening and broke sharply at the end of that month. At the October openings there was a stronger trend and prices were advanced in November.

Wool consumption in the first half of 1938 was nearly as low as in the depths of 1932 and 1934. Wool put into the works in that six months period was 50% less than the amount used in the similar period of 1937. Consumption for the year as a whole was only about 18% less than 1937.

Wool prices were on the toboggan at the start of the year, continuing weak till June, when the loss over five months was 15 to 20%. Prices then were 40 to 45% off from the 1937 peak. Levels at which the year ironed out were only slightly below those at which it began. Imports of wool in 1938 were a sixth of those of 1937, while imports of wool products were off only about 40%.

Machinery activity in wool textiles touched its low in April. By the close of the year looms were running better than twice the rate of that low point, and cards, combs and spindles had made an even wider swing from idleness to activity in the same period. Worsted machinery touched its low point in March 1938, and in April had already recorded gains which proved to be the turn. The worsted division through 1938 had its usual advantage in men's wear when prices are low and differentials over woolens are not great.

New Yarns Widen Rayon's 1939 Prospects

IN EXAMINING the rayon industry situation, it is an open question which is the more significant —the record of developments in the year just closed, or the aspects already crystallizing in the year that has just opened. Underlying the whole picture—and this applies as much to 1939 as to 1938—is the trend toward widening of horizons which will demand important changes in industry policy; most particularly, it would seem, will it be necessary to envisage rayon as an all-textile fiber, as against the former concept of limiting it to certain prescribed markets.

Looking back across 1938, the observer may definitely report progress. Five highlights can go into the record: (1) the price of 150-40 fell to the lowest point on record which, while narrowing profit margin, likewise opens new markets to the fiber; (2) staple fiber output rose sensationally and uses for this younger brother of rayon were materially extended; (3) stocks in hands of yarn producers fell steadily during the second half and at the year-end inventories were virtually normal; (4) fabric mills improved their selling position by formulation of a new greige goods sales contract which reduces speculation; (5) trend was to finer deniers and stronger yarns.

Granting that the above record is attractive, it is by no means the whole picture. Plenty of problems—some of them major in significance—faced the rayon industry at the end of 1938, and upon the progress the industry makes toward solving these problems will depend very largely the financial story of the yarn producing companies in 1939.

The outlook for 1939, with some conjectures by your reporter, may be summarized as follows: The present low prices will probably remain; or at least, no advance is viewed as likely. Market promotion of new yarns, especially of the hosiery yarns that were announced at the end of 1938 will develop slowly through the year. Fiber identification will reach a high point of retailer acceptance; on this score, it is interesting to note that within recent months some New York stores were reported to have sold weighted silk merchandise under the false representation that it was rayon! The cooperative advertising and promotion issue was critical at the turn of the year; while sharp terms were used in this controversy, the more level heads were developing a basis which it was hoped would bring about a mutually satisfactory solution. Chief market expansion in 1939 probably will be in (a) men's wear and (b) industrial uses.

Silk Problems Led by Rayon Hosiery

THAT THE year now opening will bring a further narrowing of silk's consuming market, appears reasonably evident. Whether it will mean a sharp drop in purchases by hosiery mills, which used approximately 75% of our silk imports in 1938, depends largely upon the rapidity with which silk may be displaced by rayon in that field.

In any case, it is undeniable that the advent of rayon yarns, claimed to equal silk in all the characteristics required for hosiery, constitutes a major problem of 1939 for the silk market. Raw silk leaders recognize the unlikeliness of rayon effectively displacing the "Queen of the Fibers" this year; however, they have already begun to seek out new markets and to shape policies to meet the approaching issue, when, as they expect, it will crystallize in 1940.

News of the impending rayon yarns came toward the end of a year that had brought both good and bad to the silk market. Prices behaved well; 78%, white 13/15, the standard number, rose from $1.52 in January, 1938, to $1.80 in the recent January; this gain of 18c. was achieved during a somewhat variable year. Through the first half, prices spiralled downward, reaching $1.40 in early summer. August to October brought an upswing, followed by a fairly steady market in January of the new year.

Silk consumption by hosiery mills in 1938 was estimated in the market to be about 10% above the preceding year.

Underwear fabric weavers did a better business in 1938 than in 1937, and their consumption of raw silk during certain months of 1938 was unusually high.

From the sales promotion viewpoint, the year was active. Silk continued its vigorous effort to sustain trade and consumer interest, and 1938 was marked by effective merchandising activity. The International Silk Guild, through its Forum, Parade, and other services, helped materially to keep silk in the public eye and to evoke keener appreciation of silk's quality among manufacturers and retailers.

In the first month of the new year, takings by hosiery mills were expected to equal about 70% of silk imports. It was significant that the hosiery manufacturers were covering well in advance on their raw silk requirements for 1939. Importers interpret that as indication that rayon competition is still a good way off.

Missing: 1938 Hosiery Profits

WITH DUE allowance for the fact—conceded by even the most prosperous companies—that prices have been too low for adequate return on investment, the hosiery industry enjoyed an exceptionally good year in 1938. Figures indicate a total volume exceeding that of 1937, which itself was a good year. Full-fashioned hosiery sales in 1938 are believed to be in excess of 40,000,000 doz. pr.; this division made perhaps the best showing of any part of the industry in that year.

Looking forward, the major question is: Assuming present claims for the new rayon yarns are realized, how will that affect the hosiery industry as a whole? At present, full-fashioned hosiery manufacturers take a "we're from Missouri" attitude in this matter. Many are experimenting with the new yarns; some report progress. However, even the most optimistic are doubtful that rayon will make any quick conquest of the full-fashioned market. It is believed that acceptance of rayon in women's hosiery will not come for at least two years, due to the necessarily slow task of adjusting the industry and, later, of educating the consumer.

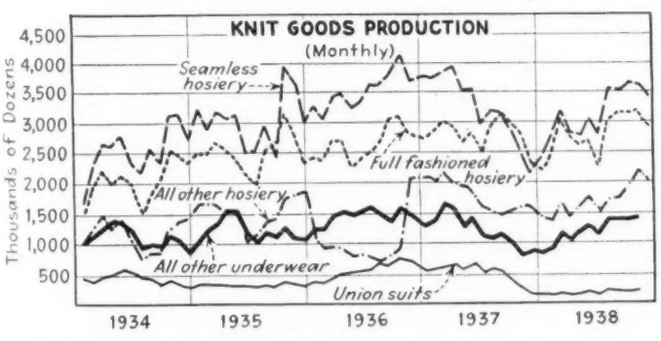
Fiber identification, which was a stubborn problem last year, is not yet solved, but industry leaders believe this issue will be adjusted soon. The task of putting identification transfers on all stockings is costly and has added to other increases in production expense; the market looks for an upward price trend during the current year. Meanwhile, the industry has made progress toward its own identification rules and it is expected that such a code will be promulgated by the Federal Trade Commission.

During 1938 the labor situation was quiet; there were no major strikes, but restlessness prevailed in the first half which had an adverse effect on the market. A novel development that may mark a trend for the new year was the acceptance by certain locals of wage cuts on agreement with mills that the difference would go to purchase new equipment. Significance likewise attached to the Federal Government's participation in hosiery manufacture in the South.

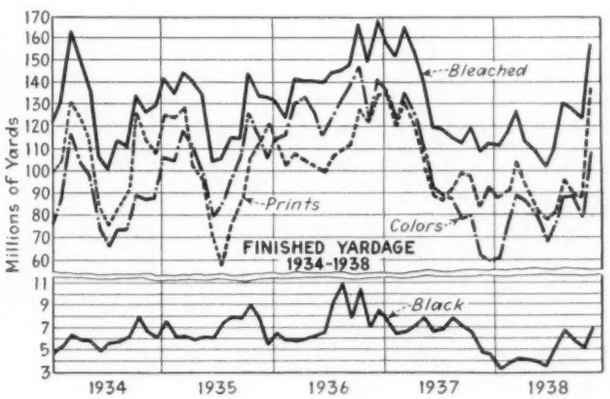
Low Stocks Brighten Underwear Outlook

THE YEAR recently closed was not very satisfactory in a financial way to the knitted underwear industry, but it had several advantages which help to brighten the outlook for 1939. Chief among these probably was the reduction in inventory. Production for 1938 totalled approximately 37,000,000 doz. garments; shipments were close to 38,000,000. Carefully regulated manufacturing schedules brought production 15% below 1937 and the smallest since 1934, and this in turn pared stocks down to 16% below 1937. At the opening of 1939 underwear stocks were normal, and the outlook from that end was regarded as unusually favorable.

Prices during 1938 were a disappointment. Quotations averaged 10% below 1937. The major problem for the new year, therefore, is the need of advancing prics. Two reasons for



Knit Goods Production: Bureau of Census figures show trends, not totals as they are for only 80 to 90% of industry.



Finished Yardage: Data from Natl. Assn. of Finishers of Textile Fabrics.

higher levels present themselves: (1) increase in costs through labelling of merchandise by fiber, which is now compulsory, and (2) possible wage raises due to the Wage-Hour Law.

Industry leaders look for a 10 to 15% increase in production and sales during the current year; however, this will bring little help at the present unprofitable prices and it simply stresses the need for a rising market on quotations.

A highlight of 1938 was the progress made in fiber identification of merchandise. Due to the frequent combination of two, three and even four fibers in a single underwear garment, identification has proved a vexing problem; however, labelling methods now are gradually becoming standardized. Progress was made on developing a code of practice in shrinkage, weighting, combed yarn content, etc., and the Underwear Institute expects rules governing these functions to be promulgated within a few months by the Federal Trade Commission.

Outerwear Hopeful for New Year

THE KNITTED outerwear industry enters 1939 with morale considerably improved. Among the causes for this confidence four may be cited as outstanding: (a) Increased popular interest in swimming and sports generally; (b) a conviction that, despite woven fabric competition, the knitted suit is holding its own for swimming purposes; (c) while 1938 saw several serious price breaks, profits for the industry as a whole were about equal to 1937; and (d) the remarkable revival of women's sports apparel, which division expects to show increased gains in 1939.

The composite effect of these developments and trends has been to make for a healthier psychology; outerwear mills, usually more prone to pessimism than to optimism, look to the opening year cheerfully and hopefully. Probably the most serious difficulty is the threat of increased competition from British wool goods imports, as result of the recently effected Anglo-American tariff agreement. Trade leaders expect that issue to crystallize within a few months.

The year just closed was marked by substantial progress in both technical and merchandising branches. Fashion acceptance of knit goods was strengthened by vigorous publicizing of the industry's growing Paris contacts. The Paris activity contributed a lot to the surprising growth of the women's sports wear division during the year, but it also had beneficial effect on consumer acceptance of knit goods merchandise generally.

Finishers' Morale Better as Curve Swings Up

COTTON FINISHERS entered 1939 with a better spirit than has been evident for many years. And this despite the fact that in 1938 activity was below normal; profits were non-existent. A glance at the chart (on page 61) showing finished yardage tells in part the reason for the more optimistic feeling. For the last half of the year the business curve swung sharply upward. In addition, amounts of both gray and finished goods held in finishing plants were lower at the end of 1938 than at the end of 1937. There is considerable confidence, moreover, that the upswing will continue through the spring at least, and that the present year as a whole will be better than average from the viewpoint of activity.

Compared with 1937, which was somewhat better than a normal year, total cotton finishing activity was about 12% lower. The biggest loss was in dyed goods, which had a 16% decrease. Production of bleached goods and prints declined 9% and 11%, respectively. Except in isolated cases, there were no labor difficulties. In the East, Fall River Bleachery liquidated; United States Finishing Co. closed its Silver Springs plant; Aspinook was reorganized. In the South, on the other hand, several finishing plants expanded their facilities; Rock Hill started printing of rayons; at least two or three additional cotton mills are considering strongly the advisability of putting in dyeing and finishing departments.

In July, the Federal Trade Commission promulgated trade-practice rules covering shrinkage of woven yardgoods, despite opposition by the finishers, who were critical of the rules on the ground that they are not practical. Subsequently agitation was started for establishment of rules covering color fastness of dyed and printed textiles. The National Association of Finishers of Textile Fabrics, through its technical committee, immediately began a study of this subject. The committee has made rapid progress toward making tentative recommendations as to colorfastness tests and standards.

No official figures are available as to activity in the silk and rayon finishing division. It appears, however, that total yardage of goods finished was 7 to 8% larger in 1938 than in 1937. TEXTILE WORLD estimates that total production was 365,000,000 yd. in 1938, as compared with 340,000,000 yd. in 1937, 418,000,000 yd. in 1936, 440,000,000 yd. in 1935, 406,000,000 yd. in 1934, and 474,000,000 yd. in 1933.

Despite the apparent increase in activity, plant liquidations continued. United Piece Dye Works liquidated the three plants which it had closed the previous year; Textile Dyeing & Printing Co. also liquidated.

As reported in last year's review, the printers decided not to adopt the plan recommended by General Johnson for rehabilitating their industry. Later objections were raised against the proposed trade-practice rules for the dyeing and printing industry advocated by the Paterson Industrial Commission, and the F.T.C. finally decided not to promulgate the rules.

The finishers, however, continued their efforts to find a solution to their problems. A new trade association was formed, the aims of which included central billing and collecting, a central claim-adjustment bureau, open price posting, and weekly exchange of statistical information on yardage of various fabrics finished. After some sparring between employers and union officials, a new one-year contract was signed to replace the one which expired on Sept. 1. At about the same time the Dyers & Printers Employers' Association was established to deal collectively with labor problems in the Passaic Valley. Subsequently several printers of rayon dress fabrics formed a corporation known as the Allied Printers, Inc. In December these printers put into effect price increases ranging from ½ to 5c. per yard, depending on the percentage color coverage of the fabric. With the new prices and with activity at the height it was at the close of the year, the printers appeared to be making a profit. Silk and rayon dyers in the Paterson area are also making efforts to increase prices and to devise methods for equalizing wage rates in various sections of the country.

COTTON FINISHING ACTIVITY: ***Total volume processed by cotton finishers in 1938 is estimated by the National Association of Finishers of Textile Fabrics at 3,682,196,000 yd. as against an estimated volume of 4,182,841,000 yd. in 1937, 4,682,295,000 yd. in 1936, 4,071,852 yd. in 1935, and a known volume of 3,881,596 yd. in 1934. TEXTILE WORLD'S estimate is 4,400,000,000 yd. in 1933, 4,700,000,000 in 1929, and 4,100,000,000 for 1923-25 average.***

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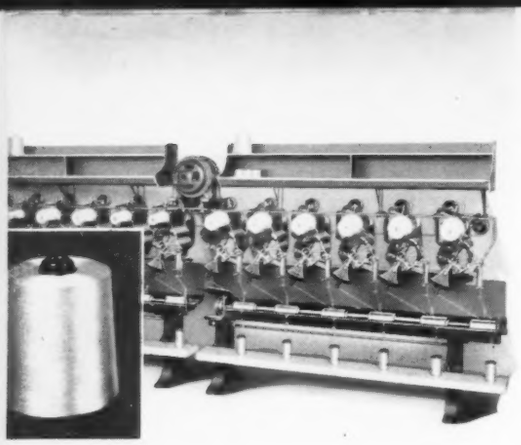
EASTMAN ACETATE RAYON

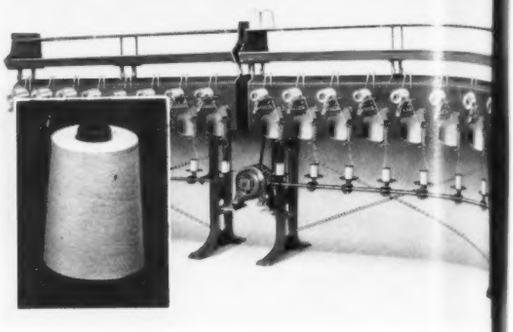


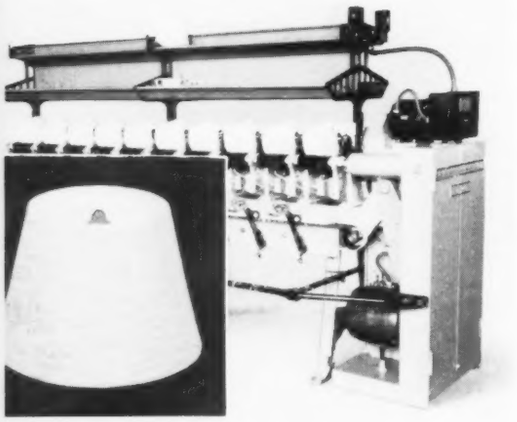
50		30
2″ to 6″	*Traverse*	4″ to 6″
6″	*Max. Dia.*	6¾″
800 to 1250	*Speed (R.P.M.)*	1100 to 1300
½ HP (6 sp.)	*Horsepower*	½ HP (8 sp.)
1 or 6	*Spdles per Unit*	8
5′8″ x 2′ (6 sp.)	*Floor Space*	8′ x 2′

50 Precise-wound cones or tubes of silk, rayon, cotton, etc. Single and multiple ends. Straight Belt Drive. Slow start spindle. Automatic lubrication.

150 A heavier model for thread and ply yarn.

30 A special machine for silk and rayon winding cones or tubes. Case encloses working parts of all spindles.

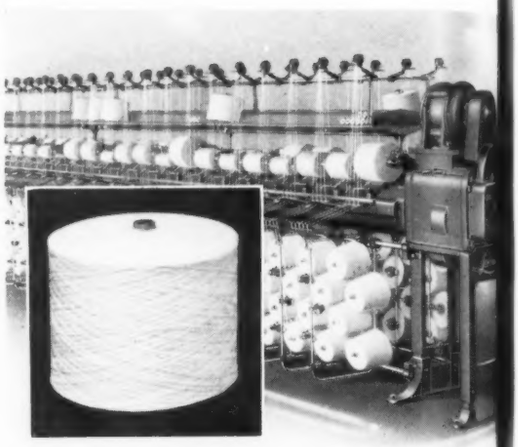


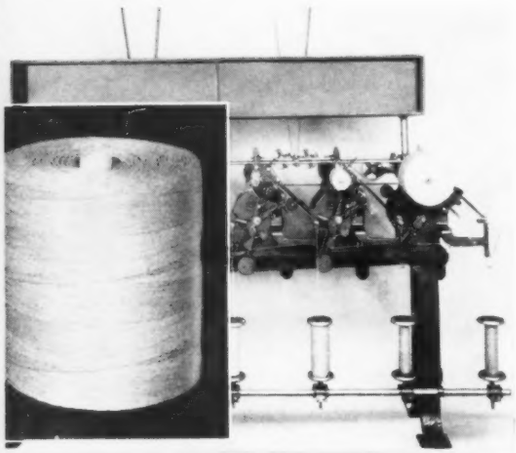


44		60
6″	*Traverse*	6″
8″	*Max. Dia.*	8″
400 to 800	*Speed* (yards per minute)	225 to 500
6 HP (120 sp.)	*Horsepower*	3 HP (96 sp.)
20 to 120	*Spdles per Unit*	12 to 96
44′ 4″ x 51″ (100 sp.)	*Floor Space*	43′ x 46″ (96 sp.)

44 High speed rotating traverse winder for paper cones of knitting yarns; warping yarns; tubes and dyeing packages.

60 Doubler for multiple-end packages. Cones or tubes for woolen or worsted. Special slub trap attachment.





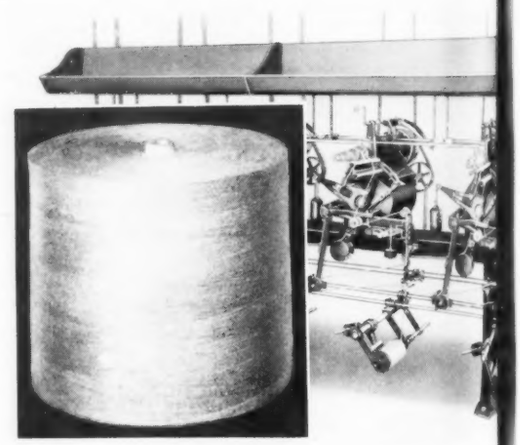
6 & 8 Illustrated		45 Illustrated	9
6″, 7″, 8″	*Traverse*	6″-10″	6″
8½″	*Max. Dia.*	11½″	8½″
*6—450-600 *8—750	*Speed (R.P.M.)*	400-600 —	— 700-800
1 (6 sp.)	*Horsepower*	5 HP	¾ HP
1 or 6	*Spdles per Unit*	1 or 5	1
*6—9′ x 2′ 3″ *8—7′ 6″ x 2′ 3″	*Floor Space*	10′ 10″ x 38″ —	— 33″ x 32″

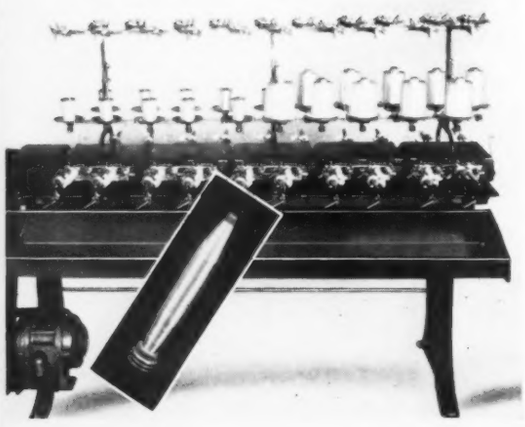
6 Tubes only of cords or heavy ply yarn, wound from unrolling spools. Separate pulley and belt on *each* spindle.

8 Tubes only of carpet warp and ply yarns taken over the head of spool. Clutch spindle or tight and loose pulley on each spindle.

45 Cones or tubes of carpet warp and heavy cord. Package 20 lbs. Adjustable traverse frame back. Bijur (one-shot) oiling system.

9 Tubes only of binder twine, wound on bare spindle from unrolling spools.





90		10
8″ to 12″	*Length of Package*	1½″ to 4″ (by 1½″)
1¾″	*Max. Dia.*	2″
2000 to 3000	*Speed (R.P.M.)*	650 to 1200
¾ HP (20 sp.)	*Horsepower*	½ HP (6 heads*)
4 to 20	*Spdles per Unit*	1 to 6 heads*
7′ 1″ x 3′ (20 sp.)	*Floor Space*	5′ 9″ x 33″ (6 heads*)

90 General winder of bobbins and cops for all weaving yarns. Automatic bunch builder.

10 Narrow loom shuttle quills and small packages.
*Two or four packages on each head.

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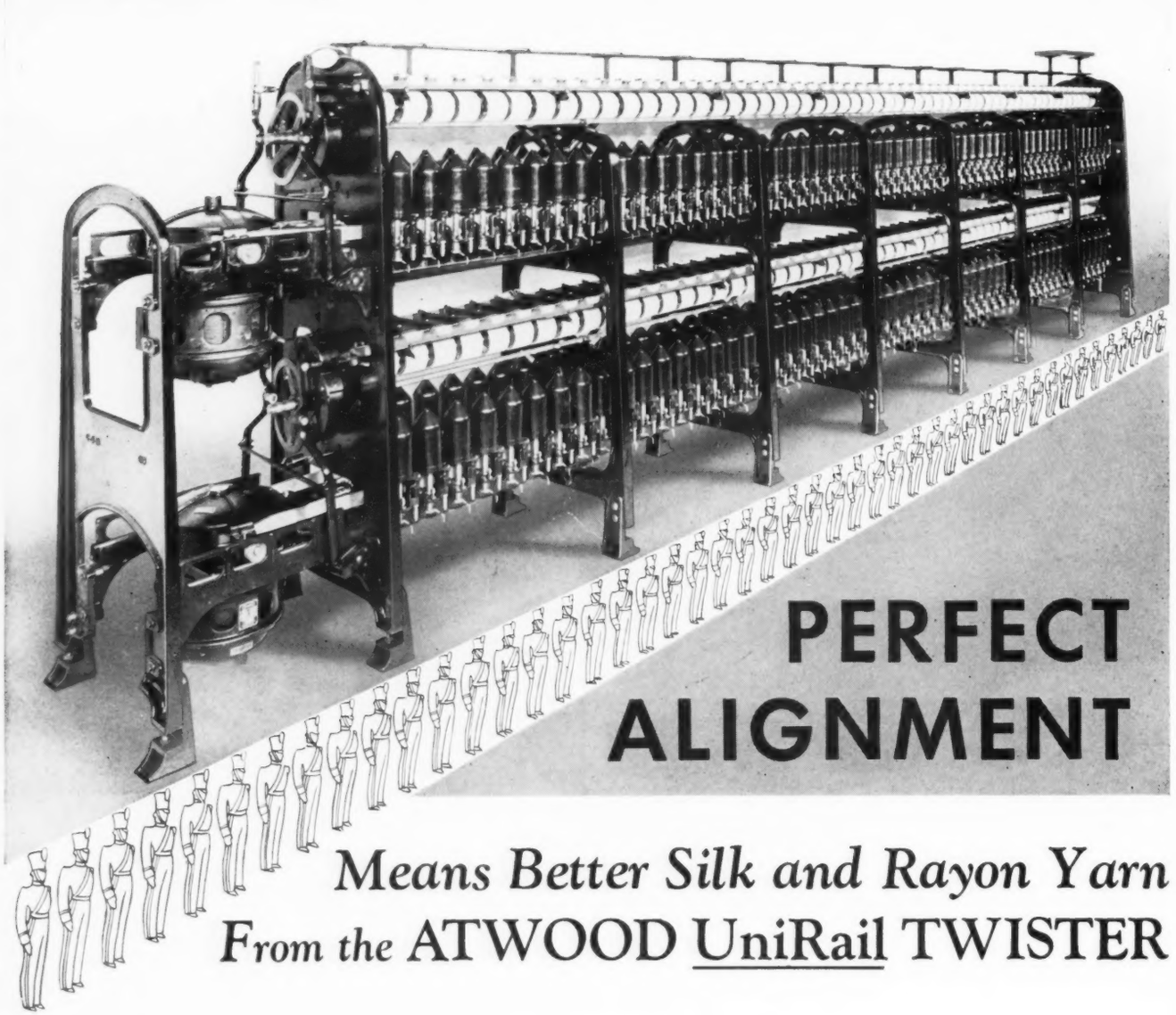
Dixie **MERCERIZING COMPANY, Chattanooga, Tenn.**



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TEXTILE WORLD

ANNUAL NUMBER

Way-To-Profits Section

From the desk of
DOUGLAS G. WOOLF

Memo to readers:

This editorial published in our October issue, now forms the work-sheet or agenda for this special section. However, in this case we are mostly "asking them, not telling them." The answers start on the next page.

D.G.W.

Can a Textile Man Make Money?

CAN a man make money, even though he is a textile manufacturer?

Frankly, we don't know.

It seems to us that it's about time for this industry to face some disagreeable—or, rather, alarming—facts. One of these is that there has been a 15-year textile depression, and that its end is not yet in sight.

Certain companies, and in fact certain branches of the industry, have made money during that period, but by and large the average textile mill has been unprofitable in most of those years. Temporary recovery has always been succeeded by collapse. Even when the industry had a record-breaking 12-months in the last half of 1936 and the first half of 1937, with unprecedented activity and good margins, it immediately encountered a record-breaking stagnation in the last part of 1937 and the first part of 1938, with the result that the profits of the former period were quickly dissipated.

The fact that right now textiles are again on the up-curve holds no assurance for manufacturers. In fact, this is just the time when they should be examining the situation to determine if there is any hope of stability in it.

•

We said above: "We don't know." It is not that we doubt that the industry *can* make money, but rather we don't know that it *will*.

The way out is clear. Its direction has developed from every study made of the industry, either from within or without. It has been repeated again and again in these columns.

Briefly, here it is:

1. Guard against over-production: That is the curse of the textile industry. Growth of the second shift in the post-war period, and more recent out-cropping of the third shift, are two of the most serious threats. However, to prevent over-production promptly and currently, the industry must:

2. Improve its statistical information: The blind spots in textile data, and the lack of relation between those data and the status in related industries make textile manufacturing largely guess-work. With more accurate knowledge, the industry will be in a better position to:

3. Hold its price structure: Its habit of giving away its shirt has been dwelt upon, disgustedly, in these columns before . . . A further way for the industry to guard against price collapse is to:

4. Maintain its wage structure: The average textile manufacturer *wants* to, as revealed by the fine voluntary performance since NRA passed away. But a minority can precipitate wage-cutting which is an integral part of vicious price-cutting. The wage-hour law, if properly administered, will help. With a stable wage and price level, the industry can then:

5. Improve its merchandising and promotion: This is the next great field for progress in textiles. The industry can hasten it along if it will:

6. Expand its research programs: New outlets for textiles can thus be created, and new and improved methods and materials can be developed. To capitalize this trend, the industry will have to:

7. Modernize its plant: With premium restored on good management and good merchandising, there will be an increased incentive to install good equipment.

These seven points will form the agenda for TEXTILE WORLD's activities in the next year.

•

The individual manufacturer can do much to hasten the development of the above program. As a basis, however, there must be coordinated action. Strong trade-association activities are vital. Too many of the textile activities of this type have lost some of their vitality in recent years. In the majority of cases, this has not been, primarily, the fault of the association executive. It has been due, largely, to loss of interest on the part of the industry at large. However it is the executive's job to keep that interest alive.

And if a selling argument is needed, we suggest the question:

Can a man make money, even though he is a textile manufacturer?

Can a Textile Man Make Money?

YES IF...
OUR READERS SUPPLY THE IF'S

IF we get out and sell . . . at a right price

By WM. D. ANDERSON, President
Bibb Manufacturing Company
Macon, Ga.

▶ Can A Textile Man Make Money?

The answer is Yes, IF he will operate his textile business with the same degree of intelligence that characterizes the operation of other successful business enterprises.

A textile business will not run itself successfully.

To make a success of a textile business, which means to make money out of it, the man responsible for the business must mix a tremendous amount of hard work with a reasonable amount of brains.

There are a lot of things a successful textile operator cannot do. He cannot produce more goods than he can sell at a profit. He must know exactly the conditions which exist in the business he is attempting to follow. His plant facilities must be kept up-to-date. He must keep "ahead of the hounds" in all matters affecting his business.

The most important factor in the program of a successful textile business is an intelligent merchandising policy that is made to work effectively.

Back in the days when I was a cadet in the business with which I am now connected, we had a salesman whose announced policy was "to get there first with the lowest prices." Of course, he did not last very long, but I sometimes think that he was the forerunner of many of his type who are connected with the textile business today, except that we have a large contingent who are not wide enough awake to be determined to even "get there first."

The decade through which we have just passed has been a tragic era for the cotton-textile business. Even the few months during this time in which our business has shown a profit have been tragic because of the repercussions that followed in their wake.

Many things have contributed to the unfortunate predicament in which the industry now finds itself, but the most important cause of our woes is and has been poor merchandising. I know of no other business in this country that has been so poorly handled from this standpoint.

A successful merchant never overstocks himself, but in our business we are in a chronic state of having more goods than our customers need. As the prices of our product have declined, we have tried to meet this situation by producing more goods, on the theory that volume production reduces costs. Important industries with which ours is intimately connected reduce their production as the demand for their product decreases, and, instead of cutting prices on the decreased production, they either hold prices firmly or increase them in order to take care of rising costs. The idea in our industry seems to be that it is smart to beat our competitor to the market and load up the customers first, shutting our eyes to the fact that it will not be long before we, too, will need to replenish our order book and will find that some competitor is quicker to reduce prices than we are.

Probably our biggest trouble in merchandising lies in the fact that those of us who are responsible for putting the goods on the market have largely quit work. We still sit in comfortable offices expecting the buyers to look us up and offer us business. These buyers do look us up all right, and they offer us the business all right, but they offer it at their idea of price and with little regard to our idea of what the goods ought to bring. Generally speaking, we accept their viewpoint as to price, because so many of us think that the important thing is to book an order, and because we do not really know how much a good merchant or a group of good merchants could get for the goods. If we book an order at a loss to the mill, we swell out our chest as our ancestors used to do when they had booked a big

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contract at a whaling profit to the mill. In our business, we have too many order-takers and too few real salesmen. A man said to me recently that he believed that a good salesman was born, and I think he was right about it—born with a willingness to work hard.

I know of no man in the textile industry who is smart enough to sit in a comfortable office in New York and successfully merchandise the products of his mill all over these United States. The textile industry depends too much on the telephone today. I believe in the telephone. It is a great adjunct to modern business, but it will not substitute for toe and ankle grease and many of the other driving forces that built the business structure of this nation. The head of a successful textile concern must ride the train and sleep in strange beds if he is to learn what people want, what new things his mills can make and sell, and if he is to find out the top price his customers will pay for the product that is made to suit him. This is a job that cannot be left altogether to one of the hired help.

IF merchandising is improved

By R. W. ARRINGTON, President, Union Bleachery, Greenville, S. C.

► It seems to me that the crying need, particularly in cotton piece goods, both manufacturing and finishing, is your fifth point, "Improvement in Merchandising and Promotion."

Substantial progress has been made in manufacturing methods and in reductions in cost but it seems to me that comparatively little progress has been made in improving merchandising and promotional activities.

IF intelligence is used in planning product

By H. L. BAILEY, President, Wellington Sears Co., Inc., New York

► There are too many of us who believe that property per se is entitled to a fair return on capital invested. We recognize that an over-supply of raw cotton, whether held from the world's markets by a Government loan or free, will depress the price of this commodity; but we seem to believe that manufacturing is entitled to a profit, whether it is directed to supplying the needs of industry and trade, or to adding its products to a supply already burdensome, and that any able merchant should find a way to sell such products at a profit.

There are too many of us who believe that the essence of sound manufacturing consists in running a cotton mill on a few staple constructions every work-day in the year at a minimum of operating cost, and that merchandising, if it is efficiently done, *must* result in a profit from the sales of products so made. The effect upon the raw cotton market of 11,000,000 bales withdrawn from the market by a Government loan, and yet dominating the world's market today, is evidence that you cannot expect to accumulate excessive supplies and escape the effect of the law of supply and demand. Intelligent management is needed as much in determining what the products of manufacturing shall be, and when and in what quantities these products shall be produced, as in securing the utmost economy in efficient operations. Management which recognizes these as equal problems, constantly demanding new answers, will still make money.

IF he sells only goods that show a profit

By HYMAN L. BATTLE, Treasurer, Rocky Mount (N. C.) Mills

► "Can a Textile Man Make Money? My answer is, emphatically, Yes," IF the textile man in question makes up his mind that he is only going to sell merchandise that shows him a profit.

It seems to me that the first consideration in the minds of those executives charged by the stockholders with the responsibility of operating their plants should be the question of profits.

Statistical information and group action are worth while, of course, but in the final analysis it is each man's responsibility whether he shall set a price that will give him a profit or run with the herd and sell his product at anything that he can get for it.

In our particular branch of the industry I am convinced that the merchandising problem is paramount. There are too many mills that have no control over their sales and who are led by their agents into believing that a certain price is all that can be secured, and until this type of executive puts his merchandising on a more scientific basis there is certainly no hope of profits for him.

It is, of course, unquestionably true that a plant must be modern in order to succeed, but even the modern plant that has a poor merchandising plan cannot make the profits that it should.

IF market needs are studied, and output balanced

By W. RAY BELL, President, Association of Cotton Textile Merchants of New York

► Your theme for two years ago sought advice on the problem of "preserving the new profit era in the textile industry." The subject then selected is proof positive that textile men have made money in the past and undoubtedly will do so again. At that time, in recognition of the cyclical changes in economic conditions and buying habits, I recommended two basic principles for standard practice by the individual units of the industry: First, the avoidance of sales from future production without a reasonable profit margin. Second, a warning against stock accumulations in excess of adequate working inventory. Neglect of both these fundamentals during the last year has demonstrated again the preferred emphasis on mill production over market considerations.

Examination of the mills which did make money last year reveals the more favorable profit opportunities for producers of styled or specialty merchandise. In such fields can be developed an individuality of product which is rarely forced to engage in purely cost competition. Also, because of the style element, there is less temptation to indulge in speculative production, unwarranted by market requirements. Even in staple specialties, individual merit in manufacturing or marketing, or both, can

be a vital factor in maintaining business on a profitable basis.

The bulk of the cotton cloth industry is highly competitive and offers less chance for originality of product or marketing methods. Under circumstances of exceptional demand, such as existed in late 1936 and early 1937, almost anyone can make money. Such years, however, are in the minority. For that reason, I again favor intensive and continual study of market needs, with output adjusted to a proper balance of supply.

IF fabric qualities are stressed rather than price

By ARTHUR BESSE, President, National Association of Wool Manufacturers

▶ What I think you mean is, "Can the Textile *Industry* Make Money," not "Can *a* Textile *Man* Make Money?"

For an individual to make money, his best bets would seem to be your points (5) Improvement in merchandising and promotion, (7) Modernization of plant, and (2) Utilization of available statistical information (which, incidentally, will be beneficial in proportion as his competitors fail to make use of the same information).

However, if an entire industry modernizes its plants, improves its merchandising and makes proper use of all statistics available, would not the members of that industry be right back on the same competitive basis where profits were the exception and not the rule? Quite probably.

The curse of the textile industry—or at least the woolen branch—is the overemphasis on price. This leads to two things—first, the lack of emphasis on other aspects, and second, the attempt to secure business by price concessions as the sole inducement which can be placed before a customer. In a sense the two are the same—one being the negative and the other the positive manifestation of the same thing.

Inasmuch as there is no limit to price competition other than that imposed by absolute bankruptcy, the obvious remedy is to stress other features of a fabric—style, handle, color, wear, promotion possibilities, integrity, etc.—in the hope of de-emphasizing price. If price is all the industry has to offer, its product will be sold solely on a price basis and neither its price nor the prices of its competitors will be maintained—nor will they yield a legitimate profit.

IF operations are based on realities

By I. L. BLUNT, Secretary, The National Federation of Textiles, Inc., New York

▶ All seven of the avenues you list should lead to profits, but perhaps most important of all is the fact that to maintain a profitable enterprise it is necessary to face realities and base operations on realities.

From observation, it would seem that profits lie in the direction of producing, at the lowest possible cost, the right merchandise at the right time in the right quantities. To do this certainly requires the most modern equipment, good merchandising and sales promotion, and a price structure that represents a fair but not exorbitant profit based on real cost and not a competitor's cost. That cost includes payment of adequate wages, for every worker is a potential consumer and the maintenance of an adequate purchasing power is a basic point in maintaining an adequate market.

With all of these factors in the best of shape, there still remains the problem of timing, both as to type and quantity of merchandise. Here is where adequate statistics came in as well as research programs. Statistics are no magic formula, they are nothing but the accumulated experiences of the industry which the informed can read and use in planning the future. The detail and the uniformity in which that recorded experience is kept depends on the industry, but far more important is proper use of the information. Other industries consider their statistical information a primary factor in successful operations. Textiles are, generally speaking, not one of those industries.

It is true that we have the handicap of rapidly changing style in many divisions of the industry, but despite that there are many lessons to be learned from recorded operating experiences in the same way that textile men use their financial records in basing their expectations and their hopes.

You will note that I have omitted the first point: guarding against overproduction. If all six of the other avenues are followed there will be little need of the first. That will be taken care of. That is a result, not a purpose, in any industry planning worthy of the name.

IF all factors are watched

By SNELSON CHESNEY, Vice-president John P. Maguire & Co., Inc., New York

▶ This is a big subject and I think the real answer is "Yes, IF the management will carefully guard against over-production by a careful study of all statistical information available, cooperate fully in the maintenance of the price structure, as well as the wage structure, follow wide-awake merchandising and sales promotion, and research work, and, most important of all, modernization of plant."

All of these things are the things you outlined, and little can be added—except that all are subject to the effects of a repression such as we are just emerging from, and when there isn't any demand for goods, profits are likely to be at a low ebb. When things are running along smoothly, which is a condition to be hoped for by all of us, efficiency in management should again result in normal profits.

IF a price is asked in excess of cost

By FULLER E. CALLAWAY, JR., President, Callaway Mills, La Grange, Ga.

▶ There is a lot of difference between the question "Can textile men make money?" and the question "Can a textile man make money?"

The answer to the first is easy. In order for textile men to make money, it is only necessary for them to ask a price for their goods which is higher than cost. This, of course, pre-

supposes that all other textile men follow the same example.

When we come to the other question "Can a textile man make money?", we have a much harder problem since this question implies that a great many other textile men are probably not making money and it is mighty hard for one mill to make money when the majority of the industry is content to lose money. I don't think there is any formula or set of rules which will enable one man in the industry to make money while the others are losing; however, I think he will have a good start if he gets up a little earlier in the morning than his competitors and goes to bed a little later at night than his competitors which, of course, means that he works harder than they do.

Isn't it silly though to force each other into this last alternative of hard work when we could all make money so much easier by asking a price which would be in excess of cost?

IF all these . . . and three more things are done

By EARL CONSTANTINE, President, National Association of Hosiery Manufacturers, New York

▶ To start with I am sure we will all agree that no one "IF" is sufficient means by which to make money. It requires certainly all of the seven points you mention with a few additional ones, among which I would like to suggest the following three:

8. Intelligent development and maintenance of morale. This should extend not only to the executive staff but equally down through all rungs of the employment ladder.

9. Sound financing, with particular reference to adequate working capital, reserves for emergencies and plant improvement, and a proper credit policy.

10. Constant, whole-hearted cooperation with other members of the industry and particularly so through the trade associations within the industry which are engaged constantly in activities which have the effect of improving the methods and practices of the industry as well as the conditions under which its product is marketed. The trade associations which will survive and become even more important influences in industry are those which apply themselves to practical industry-wide planning efforts and do not waste their time on publicity-seeking activities. Such associations are indispensable and enjoy the fullest cooperation of the more practical men within the industry.

IF statistical information is available

By ROY A. CHENEY, President, Underwear Institute, New York

▶ Very naturally, I am taking the first and second of your avenues toward profits for comment: (1) Guarding against over-production, and (2) Improvement of statistical information. Of course, I can only speak for our own industry and more particularly for our own Institute in relation to these two avenues.

To my mind, the best guard against over-production is adequate information as to production, stocks, sales, and shipments. We have been working on this matter from the manufacturing end since 1920 and today have not only adequate monthly reports so far as the manufacturing end is concerned but sufficient data for the past so that we can come pretty close to evaluating the situation as to the future. The great gap, of course, is the condition of the wholesaler and the retailer. If we can get information from the wholesaler and the retailer corresponding to the information which we now have from manufacturers, there is no reason in the world why the industry should not be conducted in such a way as to make a profit because I feel that it is the violent fluctuation of over-production and under-production which, creating uncertainty, tends to depress, and keep depressed, price levels. Depressed price levels, of course, never show profit.

I feel, also, that there is no need for the exercise of power or control over industry by the Federal Government or any other authority. I firmly believe that if the manufacturer, wholesale merchant, and retail merchant, know the exact situation with regard to stocks, etc., they will automatically guide themselves toward a profit. In closing, I may say that the Bureau of the Census, the Federal Reserve System, the Bureau of Labor Statistics of the Department of Labor, and other branches of the Department of Commerce, have been most helpful to us in our effort to develop adequate factual information.

A Red-Hot Tip

"While my natural modesty prevents me from giving you an answer for publication," states one of the victims of our inquisitiveness, "just for your private information I will give you a little tip. In answer to your question 'Can a textile man make money?', I would suggest that under present conditions these days the best answer would be: 'Yes, if he uses the right kind of engraving equipment.'"

IF prices acceptable to consumers are set

By CHAS. WHITNEY DALL, President, National Rayon Weavers Association, Inc., New York

▶ I have this thought on the "IF" you term "maintenance of price structure." It is the result of reading a volume published by The Brookings Institution, entitled "Industrial Price Policies and Economic Progress." The price of most textiles is determined by the supply of and the demand for cloth in the market at the time the sale is made. Profit accrues provided the selling price is higher than the total of raw materials, labor, and overhead, as figured by the cost accountant. In short, profit is dependent on market conditions, over which the sales executive has virtually no control. Faced with a loss instead of a profit, the sales executive has two alternatives, namely:

1. Some form of promotion, which is not feasible in the case of many fabrics.

2. Curtailment of production, which, in the long run, is economically unsound. *(Continued on next page)*

There is a militant or dynamic price policy which has worked well in other industries. The Model T Ford is the classic example of producing an article at a price to fit the consumer's pocketbook. Another example is a plumbing supply house which was offered a large order for brass hose nozzles, at a price which seemed impossible. The manufacturer, however, made the nozzle one-half as long, saving tremendously in the expense of the raw material, but performing the same service as the longer nozzle.

Immediately the objection will be raised that this may be effective on articles which move from manufacturer to consumer outlets, but would not be possible in the case of semi-finished products, like cotton gray goods. This is not quite the case. For example, the automotive industry creates a demand for sheet steel, which, in turn, stimulates the development of continuous strip mills, and lower unit costs, linked with large volume. In other words, if the consumer Firing Line is to advance, it must be supported by the Service of Supply in the rear echelon.

Briefly, I believe sales executives should give more thought to setting a price acceptable to consumers, or to those who supply them, for the fabrics needed, then fill that need with cloth produced at a cost which will show the mill a profit.

IF production were budgeted to sales

By RUSSELL T. FISHER, President, National Association of Cotton Manufacturers, Boston

► I am still firmly convinced that production budgeted to sales would do more to bring the industry back to a profitable level of operation than any other one thing. Over a period of time, of course, we do not have overproduction, as stocks accumulated when mills are producing in excess of requirements must ultimately be used up through curtailment. If the industry could adjust its production so that it would begin to curtail the minute orders start falling off, there would not be the accumulation of stocks which depress the market price for goods, and which must be worked off before resumption of buying can have any material effect on prices.

IF distribution and production are modernized

By TAYLOR R. DURHAM, Executive Secretary, Southern Hosiery Manufacturers Association

► Based upon observation and intimate contact with the hosiery industry over a period of five years, it is believed the hosiery manufacturer can make money IF . . . he recognizes two cardinal requirements. It is assumed, of course, that he must be capable of operating his business upon an efficient and economical basis and that he can produce quality merchandise. With these factors as a basic foundation, together with satisfactory employer-employee relations, then, according to observation, the two most important requirements for success are:

1. PROPER METHODS OF DISTRIBUTION: Except for those mills which have both the financial strength and sufficient size to justify maintaining their own sales force, it appears the most satisfactory method of distributing hosiery is through established, experienced and reliable exclusive selling agents. Admittedly, there are many outstanding exceptions to this statement, but there have been numerous disappointments on the part of operators of small mills who have attempted to establish their own office or who depend upon making occasional trips to the market, or who have employed the hit-or-miss fashion of listing their line with numerous agencies. In such cases, they too often find that during certain periods they are unable to accept orders, while on the other hand there are frequent long stretches of inactivity resulting in loss of production. A reliable agent is no guaranty of continuous production at profitable prices, but such a connection itself provides representation continuously on the job in the interest of the mill, supplying reliable information with respect to market requirements and providing a responsibility for the best price the market affords and as near continuous production as business conditions will permit. Generally speaking, it appears that this form of distribution for average sized and smaller mills has been the most successful.

2. MODERN EQUIPMENT: The aggressive manufacturer is keen to keep abreast of the times with respect to developments in the technological field. After equipment reaches the point of obsolescence, competition increases in geometrical proportions and the profit margin gradually decreases. Observation indicates that a really successful manufacturer is the one who does not hesitate to dispose of his equipment when it reaches the point that it can no longer be operated at a profit and obtain the benefit of the speed and better quality through the installation of modern, improved-type machinery.

IF prices were maintained by allotment of quotas

By F. W. JEFFERSON Iselin-Jefferson Co., New York

► There are many who subscribe to the thought that maintenance of price structure is impossible without control of production.

They contend that supply and demand is the only principle which can influence profits.

It is a defeatist admission because production in cotton textiles in recent years has rarely been controlled except through Government intervention, and demand has rarely exceeded supply except in times of national emergency.

Prices could be maintained if cotton mills would adopt practices which prevail in other lines of business.

Selling below cost should be met with industry-wide condemnation, but unfortunately one man's cost is another man's profit, and the manufacturers seem unwilling to determine an average cost below which they will not sell.

Minorities have made the price for majorities, and the lowest price quoted by the most insignificant manufacturers too frequently fixes the market for the whole group. It is a ridiculous practice but no one has found the way to change it.

Analysis of what the market has absorbed and can absorb is not difficult, and an agreement to divide the business and actually allot quantities beyond which each manufacturer would refuse to produce may be the answer. There are many to be brought into agreement but it could be done.

If the cake is sliced and divided,

there will be enough for all, but when the diners grab there are some who get left and others who get more than their share, and nobody gets any icing in the way of profits.

If the mill with one thousand looms would consent to sell its proportionate share and no more, and if this practice was agreed upon by all, there would be no scramble, and fair market value would be obtainable. If the big groups would agree to a plan of this kind, the small groups would readily follow.

The suggestion may come from New York or the South, but the initiative must be taken by strong manufacturing interests. The leadership is available if it will only assert itself, and in the print cloth group, there is a man trusted by all who, if chosen as coordinator, could and would work out the allotment plan in fairness to all.

It might involve elimination of third shift, and it would probably involve a recommendation for curtailment at some period of each year but what the manufacturers would lose through curtailed operation would be more than made up by the maintenance of price structure and a real profit on production.

IF the demand horse pulls the industry

By S. R. GLASSFORD, President, Bliss Fabyan & Co., Inc., New York

► The textile industry CAN make a profit but not by trouncing some elected whipping boy.

The essence of commercial profit is commercial fluidity. When production rigidity comes in the door, profit flies out the window.

Selling price is not a matter of choice. It is the inevitable quotient of dividing demand by supply. Demand is not a matter of choice.

The only freedom of action therefore is in the field of supply.

The textile production cart has been PUSHING the textile demand horse since 1923. The cart can only push the horse when it is going down hill.

If the textile industry is ever going to go up hill the demand horse must PULL it.

IF belief in working together could be developed

By HENRY P. KENDALL, President & Treasurer, The Kendall Co., Boston

► You certainly deserve every possible support in trying to improve the textile industry. It is strange to me that in one of the basic industries there is so little knowledge of costs and so little profit consciousness, at least in the cotton manufacturing and finishing end with which I am most familiar. I presume that the custom which has grown through the years of entrusting sales to commission houses and brokers who do not always have a common interest in the failure on the part of operating heads of textiles to keep thoroughly posted on the market, may have something to do with it.

Even though this industry is an exception to most of the basic industries in that it has so many relatively small units, it would seem that a common belief in the effectiveness of working together would have developed over the years. It is certainly embarrassing to hear large buyers express the point of view toward the industry that it is perfectly easy for them always to buy at less than cost. Unfortunately, such statements are not without basis.

I think your publication has advocated the importance of proper costing methods, better merchandising methods and the development of a profit consciousness. More power to you. I hope your efforts will make an impression.

IF employment can support production

By AUSTIN T. LEVY, Treasurer Stillwater Worsted Mills, Harrisville, R. I.

► "Can a Textile Man Make Money?" Actually I suppose not, unless he were prepared to receive the attentions of the United States Treasury Department.

To be unnecessarily accurate, I presume your question really is,—"Can the textile industry be conducted profitably?" Your answer, "Yes, IF . . ." is the correct answer. Your comment contains most of the "IF's," and I would like to add just one more;—and that is "if" general employment throughout the United States is sufficient in volume at wages of the necessary level to support production. If such employment, and its consequent purchasing power are not present, then none of the "IF's" which are set forth in your letter will make much difference no matter how successfully answered. You see, I am still sawing away on the same old string and shall continue to do so until the march of events proves that I am on the wrong string.

IF he calculates a profit in his price

By HAROLD R. LHOWE, Executive Director, National Knitted Outerwear Association

► My conclusion, so far as I am able to boil it down to a few words, is simply this: A textile man can make a profit if he calculates his prices to include a profit.

The trouble is that businessmen all too frequently regard profit as one of the less essential elements in the calculation of prices. In figuring costs, the outlay for labor and raw materials impresses them so greatly that they set these items down first; and they leave the possibilities of profit as an after consideration. If they can get a price to include that element, so much the better; but if they can't—well, they feel they are going to continue manufacturing anyway.

The problem, I think, is largely a matter of attitude toward a price calculation sheet. If they were as insistent on diverting a proper share of their gross revenues to themselves, as regular portions are drawn off for other purposes, there would be less frequent lamentations over great but profitless activity. Once a textile man adopts the right attitude toward his cost calculation sheet, he will be keen about dropping unprofitable items,

carrying no dead weight in his production schedule, and will be quick to concentrate attention on the items that do more than pay their way.

I do not mean to over-simplify the situation by emphasizing one element in a plexus of many or by advocating a simple maxim for coping with a tangle of economic forces. True, no textile man controls all the elements that make or detract from profits but I say that he will give himself better control if he calculates properly than if he merely pursues volume and leaves it completely to conditions out of his reach to decide whether it will be red or black ink for him at the end of the year. That is why I always urge manufacturers, when calculating their prices, to put a profit for themselves up on top at the head of the column of figures.

IF advance program of production control is set up

By T. M. MARCHANT, President & Treasurer, Victor Monaghan Co., Greenville, S. C.

► You have certainly brought up an important question. I feel as you do, that it could be answered "Yes" if the proper thought were given to the operation of the industry.

All the questions which you raise, under the different headings, are quite interesting. The first, however, (guarding against over-production) is the most important one, because if that is given the proper consideration, as I mention below, the others will very easily take care of themselves. Certainly statistical information will be helpful. Price structure will take care of itself, as well as maintenance of wage structure. Naturally with the mills on a profitable basis, the importance of merchandising and the promotion of sales, research and modernization of plants will be taken care of, because, as stated, proper consideration to the first question will make it possible for the others to be carried out. In a few words, therefore, my answer would be as follows:

If an intelligent program is set up, a sufficient length of time in advance, so as to guard against over-production, which is the most important question the textile industry faces today, keeping production near the point of demand of the consuming trade, I believe prosperity in the textile industry would be assured, and keep our customers satisfied and the trade in general, as we would not have this wide fluctuation and unsatisfactory business, the mills showing losses at one time, and the customers at another.

IF industry will operate a real research program

By WM. M. McLAURINE, Secretary, American Cotton Manufacturers Association, Charlotte, N. C.

► Yes, IF the industry, either as a group, or as individual units, will maintain and operate a real research program.

In making this statement, I am thinking of research, first, as a study of market conditions and market demands and governing manufacturing processes accordingly.

Second, as a method of studying manufacturing methods already in use and in improving them wherever possible; or stated another way, by improving the quality and style of present products, by reducing costs or making products more appealing or saleable.

Third, as a study of the attitudes and abilities of the working force and improving the program of industrial relations to the extent that all possible and reasonable results can be expected from both men and machines.

Fourth, as a study of new uses and new treatments that can be given to yarns and weaves that will permit extended uses. Cotton fibers are too beautiful and lend themselves to too many treatments for any one to think that the end of discovery or invention for them has been completed.

Both the cotton producer and the cotton textile manufacturer are too content to wait for some one else to do for them what they must do for themselves.

The mills that maintain textile laboratories and do some fundamental research are today the leading mills in manufacturing, merchandising, and financial returns on investment.

IF he is willing to study and struggle

By LEAVELLE McCAMPBELL McCampbell & Co., Inc., New York

► A textile man can make money if he has a reasonable amount of brains, if he is willing to furnish a liberal supply of elbow grease, and if he is willing to study the numerous processes and functions of his business and one at a time struggle to perfect each of them.

I might mention in passing what my friend Stewart Phinizy used to say, "I know there is money in the cotton mill business for I put it in and I did not take it out."

IF old machinery is replaced by efficient types

By R. W. SULLOWAY, Treasurer Sulloway Hosiery Mills, Franklin, N. H.

► It appears to the writer that the most important factor looking to more profitable operation in textiles is modernization of plant, and in naming this I have in mind chiefly new machinery.

One of the great handicaps under which mills in the New England area (the writer's observations are confined largely to that area) have labored is inability to price merchandise competitively at a profit. This is often due in large part to the fact that their machinery is not of the most efficient type.

It is the writer's opinion that mills should adopt a definite policy of replacing old machinery if they are to expect profitable operation. In the writer's judgment, that is the most important consideration at the present time for textile mills in the New England area.

IF this simple formula is observed

By ALBERT L. SCOTT, President, Lockwood Greene Engineers, Inc., New York

▶ I believe that it is possible for a textile manufacturer to make money. The difficulties in the way can be removed if proper group action could be secured. I mean group action entirely within the law.

If, for example, each manufacturer would use statistical information now available from various textile trade associations and would limit his production, as statistics indicated, the price structure and wage structure would, as a result of controlled production, be maintained by the law of supply and demand. This would be particularly applicable to standard lines of goods, print-cloths, sheetings, ducks, etc.

But that is a path of perfection which human beings seem unable to tread. They will not cooperate and under our competitive system, each tries to outsmart the other. Only a few are able to accomplish this and they forge ahead, at least for a while.

My formula for a successful mill, under conditions as they now are, is as follows:

First, a modern plant, well operated and geographically located so that goods can be placed on the market at a cost as low as or lower than the most favored competitor.

Second, sufficient capital for comfortable operation and to keep interest charges down.

Third, enlightened labor policy and no effort to chisel on wages below the general level in any area.

Fourth, an aggressive and intelligent sales policy closely integrated with the mill. Such a policy should have in mind not only meeting the requirements of the market but also the characteristics of the machinery to produce various products, so as not to sell goods which involve for their production a higher manufacturing cost unless a better price can be secured.

Now, these suggestions must seem to you to be very trite and yet, if you will reflect over our textile situation you will readily bring to mind many situations where one or more of these general principles are violated. A few mills, and those are the ones most generally successful in operating, year after year, at a profit, observe all of the above rules.

For mills which are now losing money—unfortunately far too many—I would place "Improvement in merchandising and promotion," along with "Modernization of Plant" first. "Guarding against over-production" and "Maintenance of price structure" are closely allied. They depend largely upon the intelligent use of "Statistical Information" and accurate costs. The "Expansion of Research programs" is extremely important for specialty mills, especially market research. "Maintenance of wage structure" I place last, not because it is not important, socially and otherwise, but because if the other factors mentioned are in operation, lowering the wage structure will not be necessary.

IF all factors are kept in balance

By W. S. NICHOLSON, Treasurer, Excelsior Mills, Union, S. C.

▶ The answer, of course, is "Yes, IF . . .," and it seems to me that there is no one road to profits among those several avenues mentioned, but successful and profitable operation is indeed a well-balanced composite of them all.

"Continued in Our Next"

THIS is just the first instalment. We hope to continue this discussion in subsequent issues. Obviously everything that has been said by the contributors to this symposium will not meet unanimous agreement. We invite statements from our readers on points of difference; also new thoughts in answer to the question "Can a Textile Man Make Money?"

To date, those who isolated merchandising as the main avenue for improvement are in the majority. But the poll is by no means closed. May we have *your* vote?—*Editor*.

IF all the points were appraised and applied

ANONYMOUS

▶ The seven points raised by you could very well form the basis for a forum discussion, but just generally I would say that the appraisal of each one of these, and the application of the importance of each to the general picture, would go a long way—if not the whole way—toward the solving of the conditions complained of.

However, you may lead the horse to water but you cannot make him drink, and there is still a great deal of selfishness, as you know, in our whole group.

IF this man had the answer, he'd hoard it

ANONYMOUS

▶ If I really knew what I thought to be a valid answer to your "Yes If," I am afraid I would be very stingy, hug it to my own bosom, and try to hatch it out for my own benefit.

I hate to be discouraging but I am afraid that just as long as Costs remain Costs, Taxes remain Taxes, Public Debts remain Public Debts, Wages and Hours remain Wages and Hours, the New Deal remains the New Deal, the National Labor Relations Act remains the National Labor Relations Act, and Social Security remains Social *In*security, there just isn't any answer.

IF the Government would scram

ANONYMOUS

▶ Your seven points are well taken, but as long as the Federal Government and its various agencies, with unlimited funds, are the controlling factors in the cotton and goods market why should there be any stability? The price is pegged by the Government; why should there be any trading in futures? With future months at discounts going into an unreasonable range why should there be forward buying?

WE QUOTE FROM ARTICLES ON FOLLOWING PAGES

Wage-Hour Structure

"I have an idea that if the textile man knows that the prices of goods underselling his in the markets were NOT made possible by abnormally low wages, he will be able to make a better approach to the problem of participating profitably in the economy of his industry."—ELMER F. ANDREWS, *Administrator, Wage and Hour Division, U. S. Department of Labor* (Page 94).

Coordination

"In a very real sense, the manager of every competitive productive enterprise is also a co-manager of each of his competitors. Whether he wills it or not, his production and merchandising policies react upon every member of the group and he in turn is helplessly subject to the policies of the others."—DR. CLAUDIUS T. MURCHISON, *President, The Cotton-Textile Institute, Inc.* (Page 89).

Research

"Provided with proper support, a research development and testing organization can pay handsome dividends in the textile industry by pointing the way toward a reduction of cost, improved uniformity in quality, and in the enlargement of markets. If, on the other hand, this work is to receive only half-hearted support, or if the 'research laboratories' are acquired primarily for exploitation, these funds might better be diverted to other channels."—G. E. HOPKINS, *Technical Director, Bigelow-Sanford Carpet Co., Inc.* (Page 103).

Statistics

"The need for more comprehensive data may be a rallying point for a Textile Council which has been urged by TEXTILE WORLD for a number of years. Surely there are many common points of interest among the various textile associations, and this suggested 'council of associations' starting off by fostering statistical, economic and technical research work in textiles, could be a most valuable and unique institution. . . . Yes, textile men can make money if they profit by experience—the recorded experience of statistics properly developed and wisely used."—STANLEY B. HUNT, *Textile Economics Bureau, Inc.* (Page 92).

Merchandising

"In merchandising there are two stubborn parties involved: the manufacturer and the consumer. The time has passed when a manufacturer could write his own ticket and say, 'if you don't like it, don't take it.' The textile man cannot stuff his product down a protesting, style-conscious customer's throat. And so he must surrender, and anticipate the consumer's needs and wants, the whims and vagaries of the market. A textile man, to be successful, must renovate his merchandising policies."—MILDRED G. BARNWELL, *Executive Secretary, Southern Combed Yarn Spinners Association.* (Page 96).

Price Policy

"Avoid that obsession of volume which besets so many of us. If a company cannot sell a sufficiently large part of the capacity of its plant, except by profitless volume sales, the sooner it recognizes that fact, and cuts its plant to fit its sales possibilities, the better. Usually we hang on too long, in the hope of better things, when a courageous operation would be wiser. The pressure towards volume not only destroys creative effort, but tends to undermine quality standards and brand prestige based on quality. It is far easier to maintain prices when the volume pressure is not there."—FESSENDEN S. BLANCHARD, *Division Manager, Pacific Mills.* (Page 90).

(*Editor's Note:* For further suggestions on this point, see the leading editorial entitled "Shrink and Sell" from the 1932 Annual Review & Forecast Number of TEXTILE WORLD—Page 77).

Can a Textile Man Make Money?

YES, IF INDUSTRY-WIDE COORDINATION AND ACTION ARE DEVELOPED

By
Claudius T. Murchison
President
The Cotton-Textile Institute, Inc.

A FEW TEXTILE men who are mill operators, but only a few, seem able to make money under any and all circumstances. Data supplied by the Bureau of Internal Revenue for the 10-year period 1926-1935 inclusive suggest that they do not exceed 20% of the total number in the group. During the last few weeks, I have assembled the published profit and loss statements of 23 mills for fiscal years ending after March 31, 1938. Of these only seven showed a profit, the remaining 16 reporting heavy losses. Without exception, these 23 mills can be regarded as above the average both in equipment and in character of management. Were reports available from all mills whose fiscal years end in the second half of 1938, the number showing a profit would, in my opinion, be considerably less than 20%. For the group as a whole the net result would be a heavy loss. But inasmuch as a few operators can always within a year's time make some profit, however small it may be, I take it that our general theme is addressed not to these exceptional ones, but to what may be termed the average or typical mill man.

During the last 10 years, taking the good years with the bad, the typical or average mill organization has done no better than break even. It is entirely possible that an exact computation would show that it emerged from the decade with somewhat less net worth than it had at the beginning. Without doubt, most of the numerous mill organizations which may be classified as average from the standpoint of profits and losses have the benefit of able management. Given the particular conditions with which they have to contend, their management as individual production units may, in the majority of cases, be virtually flawless. Of course here and there examples may be found of handicaps which can be remedied only by the individual management—such as inferior machinery, inexpert cotton buying, disadvantageous location or unwise merchandising. But after full allowance for such specific deficiencies there still remains a great residue of mills which taken individually afford no tangible explanation of their position in the non-profit group.

A Co-Manager of Competitors

Thus we seem justified in concluding that, for the bulk of the industry, individual management acting alone and separately cannot cope satisfactorily with the fundamental problem of profit making. Always to a certain degree and often to a very large degree, the money-making powers of the individual organization are delimited by the action of the entire competitive group. In a very real sense, therefore, the manager of every competitive productive enterprise is also a co-manager of each of his competitors. Whether he wills it or not, his production and merchandising policies react upon every member of the group and he in turn is helplessly subject to the policies of the others.

Business management, therefore, embraces the double function of meeting the individual problem and the group problem. This dual task is facilitated by personal acquaintance of the members of the group. Occasional meetings are desirable for a frank exchange of views. Dependable information on the statistical position of the group as a whole is essential relative to such important things as the rate of production, the volume of inventory, sales and the flow of shipments. Knowledge of production costs, of market behavior, of consumption possibilities is to be taken for granted. It is important that a group judgment be formed as to terms of sale. But these are useless unless there is present a general willingness either to abide by group opinion or a disposition to direct in good faith individual policies which are clearly in line with the group situation.

The very essence of coordination and, to my mind, its most effective form is the individual's willingness to contribute to the aggregate of factual knowledge and to carry out in his own operations the logical deductions which may be drawn from the facts as a whole. Occasionally, under emergency conditions, it is desirable to have group programs which call for uniform response from all members, but under other circumstances they are usually ineffective and of doubtful desirability. A common and spontaneous recognition of their value made possible the maintenance of the fundamental code standards after the invalidation of the N.R.A. although that action was never incorporated in a formal and official understanding.

The Over-Production Problem

With the passage of time the aims and scope of coordination undergo continual change. In years past it had to do primarily with hours of work and with the employment of women at night. Subsequently it came to include minimum wages, the prohibition of employment of persons un-

(Continued on page 91)

IT HAS BEEN our firm conviction for some years that stability of textile profits, for the industry as a whole, demands a much higher degree of coordination among the various branches of the industry than now exists. Fortunately this view is shared by Dr. Murchison, who is in an excellent position to translate belief into action. In the accompanying article, he analyzes the reasons for his conviction.
—Editor.

Can a Textile Man Make Money?

YES, IF THE PRICE STRUCTURE CAN BE MAINTAINED

By
Fessenden S. Blanchard
Division Manager
Pacific Mills, New York

MARK TWAIN once said something to the effect that everybody complained about the weather but no one ever did anything about it. Substitute the word "prices" for the weather and you are transported into the textile industry. What can a textile man do about prices? There is a good deal that he can do and is already doing about costs. A great deal of progress has been made in cost reduction, and costs tend to equalize themselves among efficient mills. But, how about the other end of the profit margin—prices?

Let us first discuss the things he cannot do. He cannot make price agreements with his competitors. If he does he will run afoul of the laws, and furthermore "understandings" of the purest kind will not stand the test of adversity. A short period of stormy weather will find a few stalwarts either actually "holding the umbrella," or at least suspicious that they alone are holding it. If the textile man can not make price agreements with his competitors, neither can be persuade them to see the errors of their ways and to insist on selling at a profit. At least he has not succeeded in doing so to date—although he has acquired a very suspicious attitude toward his neighbors and gained considerable facility in self-expression on the subject.

What is the way out of the dilemma? It is not an easy question to answer. If it were, we should have a profitable industry. Noble intentions never to sell except at a profit soon join discarded New Year's resolutions, when the spectacle of lost business arises and overhead burdens press upon us.

There is no *one* answer to this problem. There seldom is one simple solution to any textile problem. But, there are a number of ways of dealing with the price situation, which lead in the right direction.

Inventory Control

1. Improved inventory control by all members of the industry will tend to reduce the dumping of goods at sacrifice prices. This will come from better forecasting of sales and this in turn will be aided by improved statistical guides. Fortunately, this complex problem is now being carefully studied by the Industrial Research Department of the Wharton School of the University of Pennsylvania. The Textile Foundation has made a grant of funds to support this study and it is hoped that as a result of the research considerable light will be shed on what further facts and statistics are needed, how they can be obtained, and how used. In the meantime, every effort should be made by each company to put its own inventory house in order and to base its standards of control on better forecasting. If every one does a better job there will be less need and temptation to break prices.

Better Cost Methods

2. More accurate costing by *all* members of the industry will tend to maintain prices which are more in accord with costs. The Cotton-Textile Institute has done good work in disseminating information about principles of sound costing. Many of us frequently wish that our competitors were better informed on this subject. But let us first be sure that we "know the worst" about our own costs and don't "kid ourselves."

The two above aids toward improved pricing are preventive in character. The following are a few of the more positive steps which may be taken.

WHAT CAN A Textile Man Do About Prices? The author of the accompanying article answers this question by suggesting the following roads to net profits: (1) Improved inventory control and forecasting. (2) Improved costing. (3) More emphasis on creative merchandising. (4) Advertising and branding. (5) Cutting plant capacity to fit sales capacity. . . . He adds this sage comment: "Perhaps to those should be added a PROFIT STATE OF MIND."
—Editor

Creative Effort

3. More emphasis should be placed on *creative work*. Many of our textile marketing executives have come to the top, because they are good salesmen, good traders, or because they know when to buy and when to sell. There is a great need for these qualities. But there is also a great need for another quality which is too often neglected in our textile organizations—creative ability. We need more of this near the top. Sometimes our top men have it, but, when they do, its expression is too often prevented by over-emphasis on other phases of the business.

Creative effort requires time and freedom from interruption. It is not stimulated by sitting at a desk in the office, with the privacy of a gold-fish bowl. It is more apt to find expression under changing environments and stimulating contacts, followed by time to think.

There never has been in the textile industry a greater opportunity for creative work than there is at the present time—with fiber blending offering its chances for getting away from standard fabrics, with new fibers, new finishes, and new style ideas coming constantly to the fore—accompanied by an increasing demand from stores for new products and new ideas to promote.

If there is any one thing needed more than anything else in the effort to get away from destructive price competition, it is creative thinking. One outstanding fabric success which everyone has not got and which is not

easy to copy—well promoted and sold—may make the difference between success and failure to a small company or to a merchandise department in a large company. To Pacific Mills one "Chukkerspun" is worth a dozen lines of staple fabrics. Every textile company should take account of stock on its creative side. Are the principal executives sufficiently endowed with creative ability and have they the time to use it? If not, are they well supplemented by men—at least one to each department—who can supply it—and who have the time to exercise it?

Well-Established Brand Names

4. The establishment of a company brand or brands can become an aid to the maintenance of profitable prices. It is often easy to copy fabrics with something a little cheaper and to "get away with it." Without a patented process or machine, it is seldom possible to prevent a competitor from duplicating a fabric or finish—sooner or later. It is difficult to retain a cost advantage—for long. But a well established brand name cannot be used by any one else.

As an example of this, one well-known and very successful cotton crinkle dress fabric maintained its popularity and its profitability for several years, long after it had been copied at a cheaper price, simply because the stores and public had come to know it by name, through advertising and promotion, and wanted that particular fabric under that particular name. Tests of well-known brands of sheets have shown that the branded sheet with a long record of advertising behind it will outsell the unbranded even at a premium in price.

Avoid Volume Worship

5. Avoid that obsession with volume which besets so many of us. If a company can not sell a sufficiently large part of the capacity of its plants, except by profitless volume sales, the sooner it recognizes that fact, and cuts its plant to fit its sales possibilities, the better. Usually we hang on too long, in the hope of better things, when a courageous operation would be wiser. The pressure toward volume not only destroys creative effort, but tends to undermine quality standards and brand prestige based on quality. It is far easier to maintain prices when volume pressure is absent.

The above suggestions relate to some of the things which an individual company can do. After all, it is the sum total of individual company policies which determines the success or failure of the group. Group curtailments are temporary palliatives, often necessary, it is true, but too often sacrificing the companies which have controlled their inventories in order to "pull the chestnuts out of the fire" for those which have not.

Secret of One Firm's Success

The writer once asked the chief executive of one of the most successful textile companies in the world (an English company which has paid and earned liberal dividends throughout the two depressions), what he considered the secret of his company's success. He attributed that success to three things:

1. Creative research with high tested quality standards for all fabrics. An exceptionally able group of men are constantly at work on the development of new fabrics and finishes—undisturbed by the requirements of daily sales. Every line is submitted to severe tests before it is placed on the market.

2. Continuous advertising and promotion of the company name and leading lines—backed by selvage stamping, hang ticket and other means of identification. This policy has extended over a period of years, so that the lines of this company are known all over the world.

3. A one-price policy, courageously maintained.

The writer has spent several days visiting this company and studying its methods and considers it outstandingly the best managed textile company with which he has ever had any contact. The name of that company is the Tootal, Broadhurst, Lee Co., Ltd., of Manchester, England.

As has been indicated there is no one sure road to profits through maintaining prices. But there are a number of ways by which a company can help itself to move in the right direction. To summarize, the following roads to net profits have been suggested:—

1. Improved inventory control and forecasting.
2. Improved costing.
3. More emphasis on creative merchandising.
4. Advertising and branding.
5. Cutting plant capacity to fit sales capacity.

Perhaps to this should be added a PROFIT STATE OF MIND.

YES, IF INDUSTRY-WIDE COORDINATION AND ACTION ARE DEVELOPED CONTINUED FROM PAGE 89

der 16 and the restriction of third-shift operations. From some of these perplexities we have been relieved by Federal legislation, but there are still left from the old traditional list the third shift, the scientific adjustment of production volume, below-cost merchandising, and the problem of inadequate statistical coverage. The question of production adjustment is intimately bound up with the problem of adequate statistical coverage. It is commonly thought that overproduction is a phenomenon of depression periods, and the larger mill inventories which exist at such periods are pointed to as evidence of the fact. The more correct view is to regard overproduction as occurring at the peak of prosperity, but this is not recognized at the time because of the very small mill inventories and the large volume of shipments.

In 1938 mill output was almost two billion yards under that of 1937 and total stocks of cotton goods on hand at the end of 1938, if all holders are taken into account, was less than at the end of 1937. The apparent overproduction of 1938 was in large part an illusion occasioned by the abnormally low inventories held by converters, secondary processors, garment manufacturers, industrial consumers and distributors, which meant that mills were in reality doing the warehousing and taking the risk for these other groups. For the interests of all concerned, it is highly desirable that statistical coordination be effected with the large buyers in order that a true picture of the entire situation might become available.

Recent events have necessitated that the area of coordination be expanded to include the rayon and silk industries. These industries have been closely interwoven competitively and, moreover, have been placed under a common jurisdiction, Industry Committee Number One, for the purposes of the Fair Labor Standards Act. Efforts are already underway to set up a new agency to serve the public relations of the three industries in those situations where there is clearly a common interest.

But coordination is a thing which is much broader than the mechanical means which are sometimes used to facilitate its action. It does not find full expression in any particular form of agency or understanding or agreement. It is essentially a condition of like-mindedness. It is a normal, natural expression of a common recognition of facts and purposes, and the willingness to qualify individual activity for the common good.

Can a Textile Man Make Money?

YES, IF PROPER STATISTICS ARE DEVELOPED AND USED

By Stanley B. Hunt
Textile Economics Bureau, Inc.

IN THE FINAL analysis, the existence of a statistical program in any industry must stand on the test of improving the industry's profits over a period of time. Whether this end be accomplished by improving company policy (relating the company to its industry) or by improving industry policy (the relation of the industry to Government or the whole economy), will depend principally on the quality of the data, the coverage of the data, and the extent to which the industry and the individual companies therein actually use the data.

The principles and data described in this article are understood to be those coming well within the proper concepts of law and public policy, i.e. they do not envisage the improper collection, dissemination or use of statistics, as defined by the anti-trust laws and as ruled upon by the courts.

Why We Should Have Statistics

One of the chief purposes of industry statistics is to provide a better and more regular supply of goods to meet the needs of the consumer, which in itself is the way to better profits. If this end is accomplished, the beneficial effects to the employer, the employee, the distributor, and the public are obvious. For example, the "gluttonous" high level of textile activity in the spring of 1937, followed by the corresponding "famine" level of one year later, benefits no one. It is believed that if adequate statistical series had been available and used at the time, the great bulk of this "cataclysmic cycle" could have been eliminated; the inventory excesses accumulated, apparently unknown to most people, could have been avoided.

For the industry as a whole, a good statistical program should be of great assistance in determining industry policies, especially those relating to Government in such fields as the old N. R. A., the present Fair Labor Standards Act, the tariff, and the Temporary National Economic Committee (Monopoly Investigation), to mention only a few. Industry policies in these cases must be developed in terms of fact (statistics) instead of opinion, as is recognized by all business leaders.

Industry statistics allow the individual company to relate its own performance to its industry's performance. Statistics should be the basis of any appraisal of a company's position in such cases as the following: (a) the company's share of its total market and the trend here; (b) the existence of new markets and their potentialities as a guide to plant expansion and rehabilitation programs; (c) the size of the existing market for a given product and the possibilities of expanding this market by promotional effort, by an improved product, by price changes, etc.; (d) the ratio of company inventory to company production and sales compared with these same ratios for the industry, to show divergences of the company from its industry as a whole, if any; (e) the importance of seasonal patterns in the industry and the corresponding significance of given inventory, sales, or production data in the present season, both for the company and for the industry. These examples obviously are not inclusive, but are only a few typical, invaluable comparisons between a company and its industry, which are made possible by a well-rounded, industry statistical program.

For the large company, industry statistics provide a valuable test of the company's already-developed opinion of the market status. In the case of the small company, especially those companies specializing on a single product, industry statistics frequently are the only trend guide the company may have as to "what's going on" in the market as a whole.

Statistics thus are a tool of good management which may use them to better serve the consumer and thus serve itself by improving the profit position.

AS THE FIRST of two procedures toward making the cotton textile industry a safer field for investment, Robert R. West, speaking before the Cotton-Textile Institute in 1936, suggested the integration of the primary industry's statistics with those of distributors. Most intelligent observers of the textile scene have come to the same conclusion. . . . In the attached article Stanley B. Hunt analyzes the relationship between statistical development and textile profits.
—Editor.

Some Common Why-nots

A number of people object to a statistical program for various reasons. There are always, of course, those persons who will not enter *any* statistical program because they "just don't want to," or because they "know more" than any statistical program could ever tell them, or because they have something (usually unsavory) to hide, or a number of other "good" reasons.

Aside from these short-sighted reasons, however, there are a number of other bogeys frequently encountered by a statistical program. It is proposed to give here a number of these stumbling blocks, some of them valid, and then present the other side of the story.

Over the last 15 years especially, statistics unfortunately have been "sold" as the one sure way to profits. Probably "over-sold" would be a better term. Many people apparently got the idea that industry statistics could be sent to each company in duplicate, one for the president (who threw his copy in the waste basket) and one to a clerk (who usually studied his copy but who was not included in conferences on company

production and pricing plans). Apparently it was expected that the mere collection of figures, plus certain omnipotent forces, would turn wheels somewhere, out would come the profits, and all would be well. While this concept obviously is stupid, still this point was, and is, not quite so obvious to many persons. Clearly statistics are not a *substitute* for good management—they can only be a very useful *tool* of good management. To the extent then that statistical programs have been sold as a cure-all, criticism has been justified.

On the other hand, to say that good management is not widely prevalent in the textile industry would be taking the story too far to the other extreme. But how often it is that business profits in the textile industry are made, and made only, by raw goods speculation (in silk, cotton, etc.) rather than by the actual manufacturing operation of making raw silk into cloth, for example. Nor would it be fair to say that textile men should properly be called speculators rather than manufacturers. But, even if this were true, statistics still could help them.

Use of Market Knowledge

Often it is claimed that public knowledge of a large stock situation in any commodity unduly depresses the price of that commodity in the market. When analyzed, it is not believed that this concept is true. Thus if a given lot of 1,000,000 yd. of a certain gray cloth is offered to say 15 different buyers at a cut price, this lot may well grow to an effectual 15,000,000 yd. of inventory by the time rumor spreads among the buyers of this cloth number (there seems to be a market telegraph system on cut-price lots of merchandise). Thus to make inventory statistics public, and to have them come from a known-reliable source, in effect helps *both* seller and buyer.

"I know more about my market than any statistics can ever tell me," say some businessmen. One can only hope that this is always true. Statistics surely are not designed to give away, or render unnecessary, those treasured trade secrets so dear to many executives' hearts. But statistics are needed, and may be expected to function, as an invaluable testing and proving background for the day-to-day market situation. Thus statistics may be expected to supplement "trade secrets," rather than supplant them.

"Statistics are past data or dead horses," say some people. On the contrary, statistics are the proper prologue to the study of any business problem. If statistics are dead data, then so is all accounting data dead; surely accounting figures, including operating statements and balance sheets, are not made up only for the income tax people. On the contrary, accounting records are kept so that manufacturing and merchandising plans operated during the year may be tested, in detail, against the profit made. Good statistics are a very necessary complement to any financial accounting picture.

Along this same line of "past data," it frequently is alleged that certain statistics are received so late after the period covered by the data has ended as to be useless. Statistics, ipso facto, will always be received after the period covered has ended. But the receipt of statistical data by its users undoubtedly can be speeded up considerably. The average statistical organization issues its compilations 24 to 48 *hours* after receipt of the last report; but it often takes from 20 to 25 *days* after the due date for the organization to receive this "last report" from a manufacturer. A speed-up in reporting data could be accomplished easily, if really desired. Similarly, quarterly data could be changed to a monthly basis, monthly to weekly, or weekly to daily, if the speed of receipt is of that importance.

But excluding unnecessary delays in the receipt of data by an industry, it is believed that the true concept of statistics is being overlooked. Statistics do represent past data, as noted. But getting February's sales total on the first day of that month is forecasting and not statistical reporting. Forecasting, in the final analysis, is the executives' job and statistics are a tool for the executive, not a substitute for good management. This February's sales are a resultant of the accumulated experience and planning of many previous months, the statistical data for which is already known. February's sales will be influenced by the sales of these previous months, their inventory position, the production therein, seasonal and trend considerations, and a hundred other factors. In most concerns, the actual size of February's sales alone is of relatively little importance. But the *trend* of sales up to February is of great importance in determining business policy. It is in this sense of a trend indicator that statistics, properly used, can be of invaluable assistance.

What is Needed?

The primary market data in textiles are reasonably good today—cotton rayon, silk and wool data at the raw and yarn stages. The status of statistics in the knitting industry similarly may be called good. Available statistical data on the weaving industry as a whole must be called only fair. Beyond these stages, textile statistical data is esesntially non-existent. All of these descriptions, be it noted especially, are intended to describe the coverage and not the quality of the various data.

What is needed then are statistics which will measure the flow of textile goods from the raw material on through various stages of manufacture and distribution to the consumer. Let us visualize these stages (e.g. yarn preparation, weaving, converting, dyeing and finishing, cutting, and retailing) as a series of lakes created by dams. Periodically, it is our object to measure the flow into each lake, the flow out of each lake, and the resulting level of the lake. Our statistics should be able to hang out storm warnings immediately that the flow from lake to lake becomes unbalanced or clogged at any point. As it works today without these storm warnings, a big flood of inventory often develops, with its disastrous overflow and price cuts, before most people even suspect such a condition exists.

How is a Plan to be Developed?

Once the desire for statistical data exists, the method of obtaining the data is a relative detail. Numerous trade associations already exist and these agencies could be easily utilized for the purpose.

On the broad scope of just what is needed statistically in textiles, this question already can be answered by an existing group called the Textile Statisticians Group. The University of Pennsylvania, under a grant from the Textile Foundation, is now beginning an even more extensive survey on this point. Numerous trade associations similarly have made investigations to show the gaps in their existing statistical data.

Possibly, too, this need for more comprehensive data may be a rallying point for a new Textile Council which has been urged by TEXTILE WORLD for a number of years. Surely there are many common points of interest among the various textile associations, and this suggested "council of associations", starting off by fostering statistical, economic, and technical research work in textiles, could be a most valuable and unique institution.

The agencies to recommend and to collect statistical series already are in existence. What is required is a tangible and expressed desire for such statistics by those who could make this data available and who would understand and value its use.

Yes, textile men can make money if they profit by experience—the recorded experience of statistics properly developed and wisely used. Yes, if . . .

Can a Textile Man Make Money?

YES, IF THE WAGE-HOUR STRUCTURE IS MAINTAINED

THIS MUCH should be evident, by now, to all textile men: A textile man *can't* make money, so long as the wage structure is subject to the degeneration it experienced at the depth of the depression. No matter how advanced an individual manufacturer's management policies were, no matter how modern his machinery, no matter how aggressive his merchandising and promotion, he couldn't hold his own against chiseling which bore weaver's wages down to $5 or $6 a week. That sort of fool practice took away all the premium good management is supposed to command.

Consequently, the main hope in wage-hour legislation is that it will safeguard employers and employees against just such a catastrophe in the future.

We have asked a few of our readers to comment on this particular phase of the answer to the question "Can a Textile Man Make Money?" The introductory comment is supplied by Elmer F. Andrews. In his modesty, Mr. Andrews asks us to make it clear that he is not saying: "Now all textile men can make money because we have a wage and hour law." Those who have followed Mr. Andrews' sane utterances and actions during his months as Administrator will understand that, and will welcome his contribution to this brief symposium.—*Editor.*

Introduction

By ELMER F. ANDREWS, Administrator, Wage and Hour Division, U. S. Dept. of Labor

▶I am asked to introduce some observations contributed by readers of the TEXTILE WORLD regarding the workings of the law which it is my duty to administer. I have not seen these contributions, so I cannot comment on them. But I have reason to believe from my conversations with textile men and from the tenor of their remarks at our hearings in Washington, that their answers on the Fair Labor Standards Act of 1938 will be, on the whole, favorable.

Again, as in the inauguration of the NRA, we see the textile industry taking number one position. I know that the men who drew up the first Industry Code (the Cotton Textile Code) in 1933 and who helped create Industry Committee No. 1 (the Textile Committee) in 1938 did not want to create an impression that they were more public-spirited than leaders in other industries. Probably the thought of public credit never occurred to them. They realized that the need for stabilization in their industry was great. They saw that this law enabled them to take one step toward stabilization through the elimination of low-wage competition.

***IF A VOTE** were taken among industrialists as to the most important event, to them, in the year 1938, we have no doubt of the winner. It would be the Wage-Hour Act, or Fair Labor Standards Act. It is undoubtedly one of the most significant pieces of industrial legislation ever enacted in this country. TEXTILE WORLD conducts continuing research to determine the reader interest in its various features and departments. By long odds, everything on the Wage-Hour Act has occupied first place for the last several months. . . . How does this act affect profits? This is the question which the contributors to the accompanying symposium are attempting to answer.*—Editor.

Low-wage competition is not peculiar to the textile industry in the United States. The report of the President's Commission on Industrial Relations in Great Britain told how the textile industry there had been driven by low-wage competition to take an exceptional step. The industry asked Parliament to pass upon its industry-wide collective bargaining agreements and give them the force of law. This was done.

Here in Washington our Industry Committee No. 1 has been meeting under the chairmanship of Donald Nelson of Chicago and hearing volumes of testimony preparatory to arriving at a minimum wage recommendation for the textile industry (cotton, silk, rayon and certain other textiles).

Of course, I cannot answer the question posed by your editor—"Can a Textile Man Make Money?" I leave that to the textile men who have contributed to this symposium. But I have an idea that if the textile man knows that the prices of goods underselling his in the markets were NOT made possible by abnormally low wages, he will be able to make a better approach to the problem of participating profitably in the economy of his industry. And I also have an idea that the increased purchasing power that inevitably follows wage increases will help the textile man dispose of more of his product.

Wage-Floor Will Help Profits

By JARVIS CROMWELL, President, William Iselin & Co., Inc., New York, N. Y.

▶You have certainly given anyone in the business an exceedingly difficult question to answer when you ask if a textile man can make money. There are so many factors involved in this statement, over which we in business have little or no control, that I would not be able to give you a clean cut answer to the question from any angle. However, I do think that if the wage-hour structure is maintained, it will definitely put a floor to wage scales which will eliminate some of the particularly difficult competition, and thus materially assist the profit picture. However, this will only be so, provided the minimums are kept on

a basis sufficiently low to permit the industry to compete successfully with other industries and provided it is not used to obstruct efficient mill operation. Personally, I believe that a regulation of production by the industry itself would do more than anything else toward bringing profits to individual manufacturers.

Will Help Stabilize Prices and Profits

By LUTHER H. HODGES, General Manager, Marshall Field & Co. Manufacturing Division

► Although the maintenance of the wage and hour structure is not the only requirement for profit making in the textile industry, it is to my mind one of the most important. In the old days many of the mills which could not compete because they did not have modern machinery or a modern organization did the easiest thing at hand: namely, reduced wages or increased hours. If it is impossible for such mills to go below minimum standards it will serve to keep costs more in line, and will help stabilize prices and profits.

Wage-Cutting Is Asinine Merchandising

By COL. CHAS. F. H. JOHNSON, President, Botany Worsted Mills, Passaic, N. J.

► Your question sounds facetious, yet it is only too true. It is unfortunate that such an indictment of an industry can be so true.

Maintenance of a price structure is part of merchandising. The maintenance of a wage structure, while not so recognized, is also a part of merchandising. Most of our industry cut wages indiscriminately during 1938 on the theory that it would insure profits and therefore security for employees. No such thing happened. The wise men of the industry promptly proceeded to slash prices. They destroyed the value of inventories of their customers. The entire men's wear market was demoralized. It was not the customer's fault. It was just asinine merchandising on the part of the industry without in any way safeguarding their own or their employees' welfare.

Merchandising is helped by intelligent promotion. Industry generally throughout the United States seems to be seeking good-will. The textile industry, and, of course, I can only speak of the woolen-worsted end of it, seems to be hell-bent for election to create a "consumer-be-damned" atmosphere.

There is so much that our industry can say on its side but it doesn't. My answer is not "Yes, IF—" but "Yes, WHEN" they learn to work collectively to earn the trust and respect of the public, the consumer and their labor, all of whom today distrust their policies and have little respect for the industry as a whole.

Federal Regulation Indispensable

By WM. A. MOORHEAD, Agent, Joanna Cotton Mills, Goldville, S. C.

► With the elimination of the unscrupulous manufacturer who for so long has been a cancer within the textile industry, and the industry compelled to abide by sound fundamental rules—called Federal Laws—relative to minimum wages and maximum hours, I emphatically reply that the industry can succeed and a textile man can make money.

When one State attempts to regulate as to wages and hours, the reaction inevitably works against industry in that State. With such matters handled by the Federal Government there is no sound reason to argue against the fairness of same, so long as the minimum wage is held within reason and consideration for the distribution of the manufactured articles. As to hours limitation this is made imperative because we are in a machine age and it is necessary to divide the work available among a larger number. It is far better that 40 people be employed on a restricted hour basis than for 30 people to be employed without hour restrictions and 10 people be forced to sit about and do nothing.

With fair rules regulating wages and hours made into law and administered by the Federal Government, an incentive is immediately created on the part of the manufacturer to improve his machinery, working conditions, quality of goods, etc. Without such rules the progressive manufacturer is whipped before such incentive has an opportunity to develop—due to the fact that the unscrupulous manufacturer in the past has met improved conditions by his competitor with exploitation as to hours and wages.

Business after all is nothing more or less than a football game. Thirty-six years ago I saw my first football game; it was truly a bloody affair—knock down and drag out—get to the goal any old way. Well, over a period of years the game has been improved by ironing out the rough stuff and the players are subjected to very definite rules. These restrictions and improved rules have not in the least detracted from the game. Today as the opposing teams come on the gridiron not one bit of initiative has been taken away—they have simply revised the old rules. More people today are attending football games than ever in the history of the game.

The textile industry is one of our oldest, if not the oldest industry we have, and I personally feel it needs the general principles of regulation by the Federal Government more than any other large industry, due to the great number of small units.

In conclusion I wish to say that without Federal Regulation as to uniform minimum wages and hours the textile industry as a whole has little chance of MAKING ANY MONEY. Politics must be kept out of these regulations, and these regulations must be handled on the principle of the GOLDEN RULE—Live and let live. But the unscrupulous man of the past must vanish.

Floor Under Wages Should Help

By GEORGE FORT MILTON, Publisher, The Chattanooga News, and Public Member, Textile Committee

► The late Justice Oliver Wendell Holmes once said that change is the law of life. To this he might well have added the equally true and important corollary that the shock of change should be cushioned, if its real benefits are to be secured. I look at the establishment of an appropriate wage-hour structure for the textile industry in this light.

The Act of Congress under which Industry Committee Number One was set up provides the ceiling for hours of labor in interstate commerce. If, added to that, the floor that is put under wages be intelligently designed, and put into force so that it will work in practice as well as in theory, the new wage-hour structure should prove helpful rather than harmful to the textile industry. This means operating upon a realistic rather than a theoretical basis; it means making haste slowly; it means seeing to it that the minima established strengthen rather than destroy the over-all productiveness and efficiency of the industry. Furthermore, these are requirements which I believe can be achieved, given common sense and good will both on the part of those making the new standards and those who must operate under them.

Can a Textile Man Make Money?

YES, IF MERCHANDISING POLICIES ARE RENOVATED

By Mildred G. Barnwell
Executive Secretary, Southern Combed Yarn Spinners Association

THERE IS nothing wrong with the fundamentals of textile merchandising. The trouble is just that manufacturers become careless about it. The market is hard to hold. A seller must constantly re-capture it with new energy, brilliant ideas, fortified with alertness to its ever-changing whims and fancies. He must know what to make, how much to make, when to make it, and at what price, in order to be successful in merchandising.

Too many manufacturers complacently believe that they have a one-track job. They forget that it takes two tracks to run on and that these are manufacturing AND merchandising. The latter job involves the determination of product construction, design and finish, the propitious timing of new offerings, inventory control, and the dove-tailing of merchandising plans with sales activities.

The old days of textile merchandising as a sort of mail-order business are out. Time was, for instance, when the Riverside & Dan River Cotton Mills wrote to the country wholesale houses catering to the plantation commissary trade: "Gentlemen, In calculating our production for the next year we find that we will not be able to supply our customers with their full requirements. This is to notify you that we will be able to allot to your mercantile establishment only .... yards of our ginghams."

That was back in the good old lazy days when, in order to merchandise, all a manufacturer had to do was to produce goods as cheaply as possible. In order to manufacture cotton goods most economically it was done on a mass production basis, which eventually created an almost perpetual buyers' market. Too many manufacturers, today, want to sell on the old allotment basis in a market glutted with goods, and with 20 salesmen clamoring for every buyer's order. The sales agents, being dependent on volume sales for a living, as a result have become habitually dependent upon price-baiting in order to land the business. They feel forced to meet competition on the other fellow's prices by shading their own even lower, ad infinitum, until the mill winds up in receivership and the stockholders in despair.

A lot of the unwholesome attitude toward merchandising is purely psychological. It is a combination of the old attitude, "what is good enough for father is good enough for me," and a sort of mad rush to keep up with the Joneses in a price-decline era, plus a type of punch-drunkenness because of the many things such as legislation, quick style changes, etc., which have challenged the courage of textile manufacturers during the last 15 years.

Although each of the various sections of the textile industry has peculiar problems regarding merchandising, each subject to a high degree of specialization, there are some general points open for discussion regarding present merchandising conditions which if corrected would help to a great extent in stabilizing the industry.

One of the most important of these is that great merchandising fallacy, long existent in the textile business, that a sale is made when an agent confirms a booking. Getting right down to brass tacks, it simply amounts to the manufacturer giving his "customer" an option on his goods when and if the "customer" decides to ask for delivery, the decision to be dependent upon the fluctuation of the market. Sometimes, in moments of relaxation, it is admitted that this is a form of speculation. But whether they admit it or not, the manufacturers of cotton goods of all sorts have for many years played the game of "speculators' choice"—and it has proved a losing one for them. Option business is the poorest of merchandising because, first of all, the opportunity of inventory control is lost.

Renovation of this merchandising policy has been attempted in the adoption of the Worth Street Rules and the Yarn Rules of 1938. The gradual realization on the part of both manufacturers and customers that the old method of selling or buying subject to speculative trends is fallacious and works harm to both parties to the contract, and the general acceptance of the conviction that this practice must be completely eradicated, will be major steps toward making money in the textile industry. Both buyer and seller must share in the benefits of a contract. While the adoption of the rules is a step forward, the benefit to be derived from the betterment of this policy is limited by the extent of its adoption.

Another bad habit in textile merchandising is the tendency toward smugness about the product the mills are producing. Just because papa built a mill a generation ago to produce stock such as 36/2 ball warps, or print cloth, or sheeting, it does not necessarily mean that the market is

THE LARGEST number of the contributors to the symposium starting on page 80 of this issue isolate some phase of merchandising as the principal direction in which textile profits can be effected. This is no new thought. Practically every similar investigation we have ever made has had the same result. This leads us to a conclusion something on the order of the one which holds that 50,000,000 Frenchmen can't be wrong. . . . One trouble with this merchandising question is that it means so many different things to so many different people, largely depending, in this industry, on what type of product a manufacturer has. The accompanying article is broad enough to give at least a partial answer to all types of questioners.

—Editor.

not ready for something else now. Far too much stress has been laid on production activities and too little on creative merchandising. Too many textile men are unwilling to take a chance on diversified products although the market may be completely overrun with staple numbers.

That marked success can be attained in diversification is exemplified by the Carlton Yarn Mills which had, in 1933, a large stock of staple type yarn amounting to a definite liability. The mill was standing and there was no prospect of operation in the near future.

"I'd sit up all night trying to figure out how to move my stock and run my mill, and then I'd worry all day because the plan would not work, until finally I realized that if I wanted to keep from going flat broke I'd better quit bothering with something I couldn't sell and find something folks wanted to buy," said Carl Rudisill.

And so he looked around, made a satisfactory study of the market, and then had the courage to completely revamp his mill for the purpose of diversifying the output. Instead of a heavy production of single knitting yarn on cones such as he was producing up until 1933, he is today running full time on any number of fancy yarns—and he carries no excess stock.

Textile merchandising today is 90% the result of production habit, not of merchandise management. Too many textile men leave their merchandising entirely to salesmen or agents. In reality, merchandising and actual selling are different jobs, but closely tied together. If every mill man employed a merchandise manager he would save himself a lot of grief, for the problems of styling, of timing new lines, and of inventory control call for the talents of a trained specialist.

Informing the Consumer

In the textile merchandising picture today operations are so split up among the various participants that the responsibility for the quality of the final retailed product rests on nobody's shoulders. With market competition so keen, and with buyers' continuous efforts to obtain lower and lower prices, competitors obtain temporary advantage sometimes by scrimping the cloth construction or the finish, or even both, and by passing off inferior quality product as of higher grade, etc. The effect on the industry has been completely demoralizing, and consumers have at last started to protest against being misled frequently into buying goods of a poorer quality than they have asked for.

This situation definitely calls for proper and adequate labeling of textiles, and education of the consumer as to what the label means through advertising and by providing the retail sales clerks with simply stated, easily understandable information as to content and quality of the goods.

A good type of retail-clerk education and labeling has been done by the Durene Association during the last year. Accompanying men's knitted undershirts labeled "This garment is made of Durene . . ." (and explaining in simple detail what Durene meant) were folders for the sales-clerk with sketches demonstrating why Durene had the qualities claimed on the label, and stating in a plain four-point sales talk facts as to the content of the goods, quality points, and reasons for prefering Durene undershirts to others.

The Federal Trade Commission is taking a hand in consumer education through labeling, but this is a slow and often dangerous process. Better merchandising on the part of textile manufacturers would make such action unnecessary.

Through proper labeling by manufacturers fiber identification could be emphasized and certain fibers recommended for certain uses. A woman going to the seashore for a summer of active sports would have little trouble in exercising her common sense and showing preference for a well-cut sports frock which was labeled "Washable, Sanforized-shrunk, guaranteed fast to sun and water" instead of being tempted to buy a frock which was more spectacular in appearance but which would call for dry-cleaning or mountain air. In other words tensile strength should be stressed, as well as tinsel beauty.

There are actually some people still in circulation who prefer a greater cash outlay and a longer period of wearing quality to a small initial price and a short-lived garment.

Proper labeling calls for greater research, for labeling would stress quality and with the added cost of quality better styles as well as better goods are necessary for the consumer. Research along this line has been undertaken successfully by some few individual mills, particularly during the last five years. There has been a greater drive toward appealing to the final consumer as shown by Pacific Mills, juvenile designs in print cloths, designed by the juveniles themselves. More recent, and more of the novelty type, was Cannon's bath towel, blue and white reversible, with the 1938 football scores of Duke University running the towel's length. Such things appeal to the people who buy merchandise. They humanize manufactured goods. More of this snappy individual merchandise development is needed.

But equally needed is collective research which will result in some actual and generally beneficial "new uses" and less ballyhoo about those which were new a few years ago but no longer are: in other words, some new uses which will benefit a large number of mills instead of a relatively few. Just compare any "new use" development in the cotton textile industry to the merchandising potentialities of Nylon!

A Big Job Ahead

"The fault, dear Brutus, is not in our stars, but in ourselves . . ." There is much to be done, both by mill-men and by textile organizations and associations to clean up this merchandising situation. Textile associations alone have a big job ahead of them in renovating merchandising policies in the industry. This could be attacked in several ways.

They could convert their members to the practice of producing only those products for which there is a profitable demand. They could sponsor research in order to determine what those products are. They could practice inventory control. They could underwrite advertising programs on a scale broad enough to result in a definite cash return to the mills. Efforts could be made in consumer education, and in more complete labeling in a manner such as Durene has already started. Incidentally, an example of excellent factual presentation of real promotional help is the Underwear Institute's "Business Building Facts."

In some cases of small closely related textile groups making specialty products their associations could establish merchandise bureaus in charge of highly trained merchandise managers who know the market, its needs, its characteristics and its opportunities. A program could be promoted through such bureaus to secure flexibility in adjusting the type and quantity of production to the market, correlating the bureau's activities with those of the mill salesmen. Such a plan would be confined entirely to merchandise direction and would not be associated in any way with price control.

In merchandising there are two stubborn parties involved: the manufacturer and the consumer. The time has passed when a manufacturer could write his own ticket and say, "If you don't like it, don't take it." The textile man can not stuff his product down a protesting, style-conscious customer's throat. And so he must surrender, and anticipate the consumer's needs and wants, the whims and vagaries of the market. A textile man, to be successful, *must* renovate his merchandising policies.

Can a Textile Man Make Money?

YES, IF INDUSTRY PRODUCTION IS KEPT UNDER CONTROL

By William G. Ashmore
Southern Editor, TEXTILE WORLD

CAN A textile mill make money if production is kept under control? The answer is, "yes", if production really is kept under control on an industry-wide basis. Yet for a great many years, overproduction—the off-spring of overcapacity—has been the chief specter at the textile industry's would-be feast. Occasionally, unusual conditions keep this unpleasant creature away for a while, but inevitably it reappears before the banquet gets under way.

Full-fashioned hosiery has given overproduction a good run for its money in recent years. But at the rate new full-fashioned mills are going up and machinery is being expanded, it is only a matter of time until overproduction will get in its deadly work here too. The seamless branch of the hosiery industry knows overproduction well. A few years ago the rayon-weaving industry looked bright for investors, but it was only a little while before the third shift crept in and ruined the market. The cotton-textile industry has been so long locked in the grip of overproduction that most manufacturers have almost forgotten what it means to make a reasonable profit on investment.

Overproduction in the cotton-textile industry—the largest branch and most chronically ill—is discussed herewith in detail, since the basic problems of all branches are essentially the same.

Consumption and Excess Production

Production of cotton textiles during the last 10 years has fluctuated roughly from 6,500,000,000 to 8,500,000,000 sq. yd., according to the Association of Cotton Textile Merchants of New York. Exports have ranged downward during this period from almost 600,000,000 to less than 200,000,000 sq. yd., which means that annually there is available for domestic consumption somewhere between 6,000,000,000 and 8,000,000,000 sq. yd. of cotton textiles. There are no statistics to show exactly what the actual demand is for American cotton textiles, but an estimate might be 7,000,000,000 sq. yd. for a normal year, including exports.

This amount of cloth is produced on spindles which almost overnight could expand their output 50% by putting on a third shift. All of this means that there is a potential 3,000,000,000 sq. yd. or more of cloth hanging over the market at all times.

***THERE IS A wide difference of opinion among textile manufacturers concerning the advisability and feasibility of attempting any sort of production control. Ideas as to the form of such control also vary greatly. There is however unanimity of opinion on the thesis that unbalanced production is the basic trouble with the textile industry. We say unbalanced production, rather than over-production, advisedly. Year by year there is little difference between the total quantity of goods produced and the total quantity of goods consumed. The real difficulty lies with the lack of balance at any one time. This in turn depresses and disorganizes the price level. . . . It does not require any wide stretch of imagination to hook this phase up with profits. The accompanying article attempts to analyze this important phase of the answer to our question.*—Editor.**

Since 1923 there has been a decrease of spindles in place from 36,000,000 to 26,000,000, a drop of 10,000,000 spindles. Average active spindles have decreased from 33,000,000 to 22,500,000 spindles. However, a check-up will show that almost as great a poundage of cotton goods is being produced today as when there were 10,000,000 more spindles in place. The reason for this peculiar paradox of course is that (1) mills today operate a great many more hours weekly and (2) the newer spindles are technologically more efficient.

"Active spindles averaged 2,945 hr. operation per year in 1922-23; they averaged 4,183 hr. in 1936-37—an increase of 42%," according to "Wages in Cotton-Goods Manufacturing," published by the Department of Labor in November, 1938. This same source says that "it is probably technically possible to process at the rate of 10,000,000 bales a year with spindles that operated in 1936-37. Or, since an 8,000,000 bale year is the largest we have ever known, we may say that on a universal *three-shift* system it would be possible to process such an amount with about 6,000,000 less spindles than used in 1937." The bulletin further asserts that technological improvements in spindle performance have reduced the average number of spindle hours to process a pound of cotton from 28.73 in 1923-28 to 25.84 in 1933-38.

Suggested Remedies

This condition of overproduction and overcapacity is not peculiar to the United States. A number of foreign countries, notably Great Britain, suffer from the same malady. Innumerable remedies for overcapacity have been suggested from time to time, but it would be extremely difficult to execute any one of them in the United States due to the large number of competing units and the great diversity of products. Some of the more interesting of these proposals, as outlined by the Cabinet Committee report of 1935 on the cotton-textile industry, are discussed as follows:

1. *Survival of the Fittest:* Theoretically, bankruptcy and liquidation of obsolete equipment will eventually bring about a balance of productive equipment with prospective market demand. However, there is always a tendency to buy up bankrupt equip-

ment and put it back into operation. Bankruptcy is one way of reducing capacity, but it is hard on the displaced employees and on the community directly affected. And there is still no limitation on the productivity of spindles which remain in place.

2. *Limitation of Machine Hours:* Productive machine hours can be limited either by legislation or by voluntary control within the industry. The legislative method was put into effect by NRA, and much can be said for the 80-hr. week. However, instead of reducing production, NRA in effect tended to increase it by encouraging double-shift (80 hr.) operation where single-shift (50-55 hr.) operation had previously been in vogue.

Voluntary control from within the industry has never been widely successful although often it has looked as though success was just around the corner. Following invalidation of NRA, some 85% of the cotton-textile industry continued to operate under code wage and hour rules. But, unfortunately, it was not long before three-shift operation and extended machine hours gradually crept in and wrecked the price structure.

Perhaps the nearest thing to effective voluntary production control today is practiced by the combed-yarn spinning mills in the South, which manage usually to keep stocks within two or three weeks of demand. This is done through statistical reports to the Southern Combed Yarn Spinners Association which represents over 1,500,000 spindles.

An attempt to control production of print cloths was made in 1938 by the Print Cloth Group. Over 95% of the mills making this product voluntarily and individually agreed to eliminate the third shift. Observers hope that the third shift here is permanently eliminated, but cynics point out that margins have been too narrow, since the move, to give the plan a real test.

3. *Leasing Surplus Machinery:* At one time a plan was suggested to form a corporation, supported by interested mills, to lease from all textile plants a certain percentage (25%) of productive equipment for a period of years at nominal rental. This proposal has the advantage of not destroying the rented equipment, but it would involve a very complicated controlling organization. No provision is made "for the liquidation of hopelessly antiquated machinery or for the creation of new mills or for the expansion of efficient old ones." It is obvious that "some purging of equipment by competitive forces" is necessary for the success of any controlled plan of this type.

4. *Purchasing Surplus Equipment:* A corporation, similar to the one described in the preceding paragraph, was proposed to purchase textile plants as they come on the market and liquidate machinery and buildings. Obsolete equipment would be scrapped and the better machines used for replacement purposes under controlled conditions. The advantage of this plan is that it is direct and simple. However, there are a number of disadvantages: "There would be little control over the rate of elimination. The purchasing organization would have to wait for mills to voluntarily offer themselves for sale. The process would be irregular and spotty, both geographically and as to types of products made."

5. *Purchasing Obsolete Equipment:* A proposal presented some time ago is to purchase and scrap some 5,000,000 obsolete spindles now in place. It was suggested that the Reconstruction Finance Corp. loan a substantial sum to the cotton-textile industry for a period of from ten to twenty years, to be administered by an industry committee. This committee would invite mills to offer spindles for sale at quoted prices and would buy them under Government supervision at the lowest price available. Such a process would automatically insure weeding out the least efficient machinery. In addition to reducing capacity, this plan expects industry "to assume also the burden of paying displaced employees a dismissal wage." A New England corporation, a private enterprise, operated somewhat along this line (except for the dismissal wage) and has been fairly successful in reducing obsolete spindles within the New England textile areas. It has been suggested that a similar corporation be formed to liquidate obsolete southern spindles.

6. *Direct Control:* A final plan suggested embraces not only direct control of equipment but also control of production through the "allocation of quotas supported by a pooling scheme under which assessment would be levied for excess production and compensation made for underproduction." Quotas would be extended to individual mills and a broad administrative authority set up for the whole industry. This plan is not considered practicable for the American textile industry due to the large number of scattered units and because of the diversity of products. And, in general, such plans are thought to be against American public policy.

Foreign Control Methods

For several years the English cotton-textile industry was kept in partial operation by a voluntary agreement between the mills and workers whereby the workers agreed to work on short time even though there was no compensating increase in wages. However, by 1926 the difficulty of obtaining compliance in this "share the work" movement more or less caused the plan to break down. Another disadvantage was that keeping a large number of spindles and looms in partial operation increased overhead costs per unit and prevented elimination of inefficient mills.

Another British attempt to control production was made in 1929 by formation of the Lancashire Cotton Corp., an amalgamation of some 10,000,000 spindles, designed to "increase efficiency, reduce overhead, improve selling methods, and eliminate existing inefficient producing units." Its chief weaknesses were (1) the tendency of the owners to stand out for too high a valuation of their properties and (2) its failure to achieve vertical integration.

A third plan proposed in Great Britain, and favored by a majority of the industry itself, provided for the buying of equipment through funds from a tax on the industry. The aim was to take 10,000,000 surplus spindles out of production without reducing the total output, concentrating production in the most efficient mills. This plan ran into a snag in 1935 when the Government announced that it would "require the industry to make provision for the displaced operatives" before giving legal assent to the plan.

An apparently "successful rationalization plan for cotton-textiles has been put into effect by Japan. A law passed in 1931 requires nonmembers of industrial associations to comply generally with control measures adopted by the association governing their respective industries. The Japan Cotton Spinners' Association, embracing 97% of the cotton spinning spindles in the country, is able to control the production of its members by sealing operating spindles when demand for goods falls off. The association also has complete control over foreign marketing and buying, with obvious advantages.

Control by Individual Companies

The rugged individualist type of manufacturer still believes that inventory control should be left entirely to the individual mill. This, theoretically, is the ideal way of controlling production, but for some reason the law of supply and demand does not always seem to apply to textile mills producing cotton gray goods. The only places where inventory control by individual companies seems plausible at the present time are in those mills which either do not sell in an open market or sell branded products through their own selling houses.

(Continued on page 102)

Can a Textile Man Make Money?

YES, IF FOREMAN-TRAINING PROGRAMS ARE DEVELOPED

THE LEADING editorial in the last issue of TEXTILE WORLD high-lighted foreman training as one of the most important needs in a textile mill organization. It was emphasized that that term is correct insofar as it goes, but that actually the activity so described means not only training in technique and industrial relations, but a virile and continuing contact between the chief executives and their operating executives, based upon mutual understanding and mutual respect. It was further stated that there must be a regular organization—of the type usually referred to as foremen's council—in which the two groups are mutually frank.

There Are Several Answers

In this present series of articles on the question "Can a Textile Man Make Money?" it is difficult to isolate any one of the several answers as the most important consideration on the road to profits. Probably all of them—in proper balance—make up a package which will supply net income.

However it is certain that no one of the indicated lines of action means more, day in and day out, year in and year out, than a sound relationship between the management and the keymen. There may be a company which has continued to make money over a period of years and which has not developed such a relationship. If so, we have never heard of it. In fact we doubt its existence.

In order to keep the discussion of this particular subject from abstractions, it seems best to bring it down to cases—or rather to one case. Consequently there was selected a company which over a long period of years—approximately 20 years, in the memory of this writer, has persistently and consistently tackled this problem of foreman training and allied activities. We refer to Marshall Field & Co., Manufacturing Division, Spray, N. C.

Before describing this company's problem in detail, a word is in order concerning the broad result. It is the consensus of the management that the effect of the whole development upon the foremen groups and their relation to the company, has been nothing short of remarkable. It has become a practical and ever-working channel for the passage of reactions from the management to the operating groups and finally to the men at the machines.

> ***HIS RELATIONSHIP with the key-men of his organization is or should be a problem occupying a major part of a textile manufacturing executive's time and attention. It has been our observation that those manufacturers who devote this proper amount of time and attention are the successful ones. We are equally convinced that, where this job is overlooked or slighted, a profitable enterprise is practically impossible. . . . This article gives in useful detail the method by which one company has developed and maintained sound relationship between the management and the foreman group.***—**Editor.**

The Marshall Field Program

The foreman-training program at Marshall Field perhaps can best be described by explaining the entire educational and training system, of which foreman training is a part. The present general program had its beginning in 1919 when a number of evening classes were established for employees and foremen. Out of this and other training projects grew the Carolina Cooperative Council, previously mentioned, which was organized with a nucleus of those persons interested in the original evening classes. From 1920 until 1937 interest continuously increased in both the educational classes and in the Carolina Council. As a result, in 1937 the present vocational school was established, foreman-training conferences were begun on a scientific basis, and the ground-work was laid for a general employee training program. Regular conferences for executives (superintendents and "up," and staff men) were begun in 1938.

Although the educational program had its beginning with the evening classes, its development and growth have come more or less directly from the Carolina Council. This organization today has a membership of approximately 500 persons, representing nearly 100% of the eligibles. The group meets once a month with an average attendance of 60%. Dues are $1.00 a year, and any employee is eligible for membership who contacts two or more persons per day. This means that a loom fixer, for example, can join the group with the same privileges offered a superintendent. Officers are elected from the membership.

The Carolina Council is fundamentally a discussion group for all problems of industrial relations. One of its most valuable features is that it offers management an opportunity to discuss company policies with a large cross-section of key men, who in turn pass the correct information on to the man in the mill. The usual program consists of an address on some general subject of interest to the group as a whole, such as the business outlook, taxation, legislation, etc. In recent years, a Junior Council with similar purposes has been formed for the younger persons of the community.

General Educational Program

As a good case-study, a skeleton outline of the complete Marshall Field educational and training program is given herewith. Purpose of the program is "to give every individual in the organization a better understanding of the company, its policies, principles and procedures; to bring about a better understanding, on the part of employees, of management and its

problems; to help attain a spirit of cooperation and a state of coordination between all individuals and units within the organization; and to help every employee reach his maximum efficiency and usefulness."

Nearly all of the following projects are in operation at the present time although a few (marked with an asterisk*) are still projected. It will be noted that particular emphasis throughout is placed on foreman training.

EVENING SCHOOL CLASSES: These classes open in October and close in March, with 20 periods in the fall and 20 in the spring. The school is operated under the Smith-Hughes Act with supervision from the State Board of Education. These classes are a community project and cooperate with other agencies, such as the WPA literacy classes. Many foremen are active as teachers and students.

Regular textile subjects are mill arithmetic, carding and spinning, loom fixing, designing and analysis of cloth. General subjects include chemistry and waterworks, hospital chemistry, dietetics and slide rule.

VOCATIONAL SCHOOL: This school opens in September and closes in May, with regular courses covering 32 weeks. Educational standards here approximate regular high school requirements, and the majority of the students are young men.

However, there is no age limitation as to attendance and many older employees take advantage of the classes. Two full-time teachers are employed who are assisted by several part-time instructors.

Courses include yarn manufacturing, weaving and designing, advanced courses in weaving and designing, lectures on special business topics, woodworking shop and machine shop. In addition, there are teacher training courses for vocational school instructors and for evening school teachers.

FOREMAN TRAINING: This is broken down into a number of phases as follows:

1. General conference on policies, principles, etc.
2. Weekly or bi-weekly conferences on technical problems.
3. Bi-weekly plant safety meetings, including attendance at zone safety meetings.
4. Weekly distribution of Elliott "Management Information" bulletins.
5. Monthly distribution of "Industrial Facts."
6. Monthly meetings of Carolina Cooperative Council.
7. Cooperation on textile and technical magazine subscriptions. (Over 300 subscriptions to trade publications go to key men.)
8. *Wage incentive conferences.
9. *Conferences on costs and budgets.
10. *Conferences on labor laws and other related legal subjects.

EXECUTIVE TRAINING: This is intended for staff men and superintendents, and includes:

1. Conferences on company policies, procedures, etc. Topics include general policies and management information, costs and budgets, wage incentives, personnel problems and activities, production problems and engineering projects.
2. Monthly meetings of the Carolina Cooperative Council.
3. Cooperation on subscriptions to textile and technical magazines.
4. Routing of textile and trade publications.
5. Attendance at trade association and other management or industrial conferences.
6. Monthly meetings of Central Safety Committee.
7. Distribution of "The Field Glass" (house organ).
8. Standard practice instructions.

GENERAL EMPLOYEE TRAINING AND EDUCATION: This phase of the education program is in the process of being developed, and some parts of it, especially those phases applying to new employees, have not yet been put into effect. There are two divisions:

1. New Employees—eventually will be given an employee handbook*, a safety manual*, instruction in company policies* and on-the-job training*.
2. Present employees—now receive bulletin board information on safety, etc., receive management letters and management talks, attend first-aid classes and monthly meetings of the Junior Carolina Council.

Foreman Training

The foremen meet regularly every two weeks for a general discussion session, with the superintendent as chairman. Minutes are kept of each meeting and later distributed to the membership. The fundamental purposes of these conferences are: (a) afford foremen an opportunity to express their ideas concerning company problems, policies and methods, especially as they relate to personnel matters, (b) to develop foremen in the art of creative and constructive thinking along the line of handling day-to-day personnel situations, (c) to help foremen gain all possible information concerning the company, (d) to provide the foremen with contacts with other executives so that they may broaden their knowledge of industrial problems, and (e) to develop the qualities of foremanship, particularly with respect to leadership, through a training which will bring poise, confidence, and intelligence.

The general procedure of these meetings is based on the actions of the conference leader. He is expected to bear in mind certain rules:

1. "The conference leader stays out of the discussion after his problem is introduced.
2. "Members are encouraged to be outspoken through tact, consideration and fairness.
3. "The leader sits down as the discussion moves on in an effort to stimulate discussion among the members.
4. "Conference leaders are not teachers, and questions aimed at them should be thrown back to the group. The leader should ask questions now and then, but never one which can be answered by 'yes' or 'no.'
5. "The leader avoids making 'pep talks,' all time being devoted to discussion.
6. "The responsibility of making decisions should rest with the foremen, but questions under discussion should not be put to a vote as this stirs up antagonism.
7. "The negative side of a question is always taken up first, since it is easier to see what is wrong with the proposition than what is right.
8. "No member of the group should be 'coached' to take a certain attitude.
9. "Thinking of the group is recorded on the blackboard or a chart. Appropriate illustrations or stories are helpful in getting a point across. In general, the same language used by members of the groups is used by the leader in order to avoid confusion."

Some of the topics discussed at the general foreman conferences are proper selection of employees, introduction and placement of new employees, training new employees, transfer and promotion, incentives—financial and otherwise, foremen-employee relationships, handling employee grievances, safety in textile plants, cooperation between key-men, and the foreman as a manager.

Typical Conference

Regular foremen conferences at Marshall Field are usually based around discussion topics worked out well in advance. Typical of these topics is one, selected at random and highlighted here, entitled "Handling Employee Grievances." This particular conference happened to fall into three general phases, although there is no set rule regarding such matters.

The first part of the meeting was devoted to consideration of a hypothetical case typical of a problem which might arise in any mill at any

time. The case was stated as follows:

"Some difficulty arose when a group of weavers, following some talk among themselves, spoke to their second-hand regarding what they considered an unsatisfactory rate of pay. These employees stopped their work and presented their complaint. The second-hand told them to return to their work and he would take the matter up with the foreman next day. When the foreman called the group in next day each member hesitated to speak, fearing that the one who spoke first might be termed the leader of the dissatisfied group. Finally one man did speak and presented his complaint. According to his statement, later he was branded by the foreman as a 'strike leader and a trouble maker.'"

Conclusions, following a lengthy discussion of the facts, were: (1) Foreman should have received the group courteously and made the workers feel at ease; (2) foreman should not have accused the spokesman of being a trouble-maker; (3) foreman should have told the group that he would take the matter up with the superintendent if he could not handle it himself; (4) the matter should have been handled promptly; (5) if the foreman knew that wages paid were maximum for the job and in line, he should have explained it to the employees; (6) if the request could not be granted the employees should know the reason.

The second major part of this conference was built around a number of general questions:

1. "How can a foreman anticipate grievances and correct conditions before employees complain?
2. "What percentage of employees ever give expression to grievances?
3. "What are the most frequent sources of employee grievances?
4. "What should be done with chronic complainers?
5. "What are some of the precautions to keep in mind in handling employee grievances?
6. "Why should the foreman handle all possible grievances?
7. "What should be the relationship between foreman and employees?
8. "Why do employees go over the head of the foreman to see the superintendent?
9. "In cases where the employee can't be satisfied by the foreman's answer, what should be done?"

The third phase of the meeting was a general summary of conclusions:

1. "Most grievances are symptoms of some condition which should be remedied.
2. "Employees making grievances should be shown every courtesy and consideration.
3. "Foremen should encourage employees to air their grievances.
4. "It is desirable that foremen handle all possible grievances.
5. "Foremen in many cases can anticipate grievances and correct conditions before complaints are made.
6. "There are certain precautions to keep in mind in handling employees' grievances."

Complete minutes of the meeting, including answers to the questions in part two and specific references to Marshall Field & Co., were later passed to each person present.

YES, IF INDUSTRY PRODUCTION IS KEPT UNDER CONTROL CONTINUED FROM PAGE 99

However, there might be hope for widespread individual control if all companies would work out a systematic plan applying to their specific goods and mill.

John J. Madigan, author of "Managing Cloth Inventories in the Cotton-Textile Industry," cites a specific case of controlling inventories in a gray-cloth mill producing semi-staple fabrics as follows:

"In 1933 the mill in question had a rated capacity of about 600,000 yards a week. Some 32 basic fabrics, in several finishes, accounted for about 76% of the mill's production. The rest of the production was on fancy specialties which were sold only on order. The system of inventory control may be outlined under the four following major points:

"1. Sales forecasts were made by basic fabrics by months. (Orders to be received, not deliveries.)

"2. For each fabric the yardages which the mill might be authorized to make and have on hand by months *in excess of orders* on the books were determined.

"3. The products of the mill were merchandised in such a manner as to give sufficient elasticity in loom assignments to allow the mill to accomplish the following tasks: (a) to fill orders on time; that is, increase or decrease production in accordance with the volume of unfilled orders; (b) to smooth out production so that excess yardages could be produced during slack periods to be available during rush periods.

"4. The mill position on all fabrics was checked monthly or semi-monthly and the estimates or control figures were revised if necessary."

Conclusion

There is no doubt that overproduction and overcapacity is one of the main problems facing the textile industry. And it is equally apparent, from the various suggested remedies reviewed here, that no one plan suggested to date is likely to be the answer.

However, laying aside legal and practical difficulties, it seems possible that a combination of several of the suggested plans might be the solution. This would perhaps include "limitations of the hours of machine operations, the leasing system for surplus equipment, and purchases on a limited scale of the most obsolete units." A good beginning would be some form of individual company control among those plants usually considered to be leaders of the industry. Another step would be to secure adequate statistics in blind spots, such as stock held by converters, jobbers, etc.

Any such industry-wide control would probably have to be carried out under Government supervision or industry supervision with teeth. Otherwise, there might be expansion and modernization of the remaining plants which would offset any planned reduction of capacity. Also, displaced workers would have to be adequately provided for in order to prevent extreme resistance from communities affected and from pressure groups.

In any discussion of overproduction, it should not be forgotten that the constructive view of the situation is to increase the consumption of cotton by developing new uses. A great deal of thought has already gone into this matter, but the practical results so far have not greatly changed the rate of cotton consumption. Also, the industry should not overlook foreign markets as a possible outlet for additional cotton products.

Overproduction and overcapacity can be controlled in the textile industry just as these conditions are controlled in the automobile, radio and steel industries—even though the problem here is much more complex and difficult. Some improvement has been noted in certain branches of the industry during recent years, which has largely come about through individual planning. However, real and permanent relief cannot be expected until the whole problem is carefully appraised, and a systematic form of rationalization worked out by industry leaders.

Can a Textile Man Make Money?

YES, IF RESEARCH IS PROSECUTED VIGOROUSLY

FOR MANY years the textile industry was a highly profitable one. Demand for staple fabrics was constantly growing; manufacturing and finishing operations were fairly well standardized; yarns and fabrics which the textile manufacturer offered were accepted with little complaint by consumers. Under such conditions there was no particular need for research and new product development.

Recently the situation has been entirely different. The textile industry as a whole has not been a profitable one; manufacturing and finishing methods have undergone rapid changes; demands of consumers of industrial, household, and apparel fabrics have become more and more exacting. Paper, rubber, and other non-textiles have made inroads into textile markets.

Some of the more progressive textile manufacturers sensed these changes. They realized that if they were to stay in business and make a profit, they would have to develop new and improved types of products for which a market existed or could be created. Consequently, they began to set up research and development departments as necessary supplements to their production and sales departments.

These men were in the minority; and as yet textile manufacturers by and large have given less attention to research than have leading companies in the chemical, rubber, and various other industries. But in those mills where research has been carried out for some time under proper conditions, tangible results are evident.

In establishment of a research department there are certain principles which should be followed and certain pitfalls to be avoided. The first of the following two articles discusses the way in which research and testing can be organized under one head in a textile mill. In some instances, routine testing and control are not considered to be functions of the research department. This will be apparent from the second article, which outlines the research activities of the Kendall Co.

ORGANIZATION AND INTEGRATION OF RESEARCH AND TESTING

By G. E. Hopkins
Technical Director
Bigelow-Sanford Carpet Co., Inc.

▶ Integration of the research development and testing responsibilities of a textile mill under a single technical organization can be discussed under four headings: What activities shall be included? How shall the functions of the technical department be tied in with those of the purchasing, manufacturing, sales, and cost departments? Why it is better to segregate these functions? How shall such a department be organized?

Briefly, the scope should include: specifications for selecting raw materials; control of quality of raw material, stock in process, and finished product; cost reduction and quality improvement; development of new products; trouble shooting; and sales-service work in connection with market surveys and claims.

The organization should be independent of, but closely tied in with, the purchasing, manufacturing, cost, and sales departments, obtaining data from and supplying service to each.

The purchasing department should refer to the technical organization all new materials submitted for consideration. The manufacturing department should refer to it all suggested changes in procedures, equipment, and products.

The cost department will depend on the technical department for guidance in forecasting the effect of procedure changes on costs.

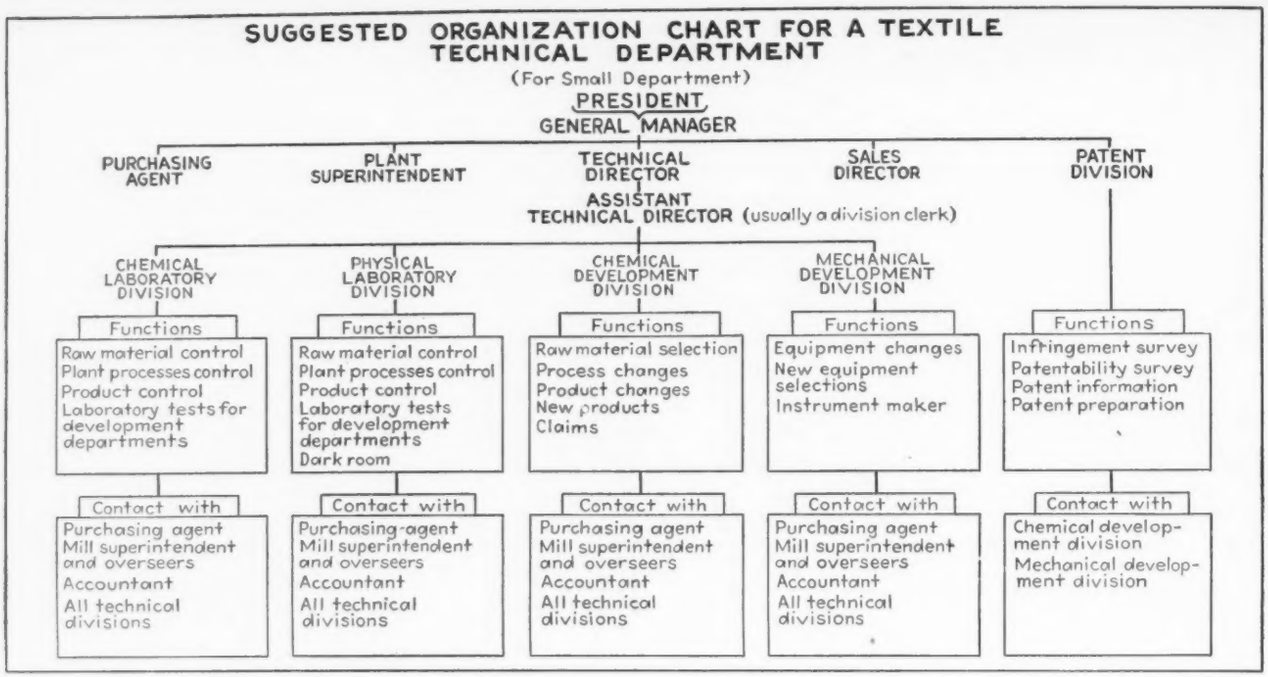
Sufficient contacts should be maintained with the sales department and the market to assure that product inspection is consistent with the interest of the market, that new products are developed which will be demanded, and to render the best possible technical-sales service.

Consolidation of this type of work makes possible the utilization of specially trained experts in various fields —such as chemistry, enginering, physics, optics, and statistics—on problems throughout the organization. Each idea may be developed or considered with regard to its over-all effect on the ultimate quality and cost of the product, rather than approached from the point of view of any one department or its apparent efficiency in one particular operation. Data resulting from all the experimental work are consolidated, thus avoiding duplication and assuring maximum use of all successful principles.

Practical Outlook Needed

Such a technical organization cannot be "installed" as a complete operating unit. It must be developed or allowed to grow into its sponsoring company as the latter develops its ability to absorb the benefits to be derived. In the early stages, men should be selected who have a practical outlook, a strong sense of economic values, and personalities which will make them welcome in their contacts with the other existing departments. As growth proceeds and as the mill learns to absorb the functional approach, specialists with more advanced academic standing may be added.

Typical organizations are shown in the accompanying charts. The technical director reports directly to



the general manager, as does the plant superintendent and the director of sales. He must be constantly informed on work in allied fields through attendance at scientific meetings and personal contacts. Therefore, a competent assistant is required to take over in his absence.

In large organizations service functions, such as library, dark room, instrument maker, clerical and stenographic staff, may report to an administrative officer. More frequently these units report directly to the division most closely associated with their work.

The patent division may be included directly within the technical group or it may be independent, reporting to the general manager, or to the treasurer. It should inform the development and research divisions of patent activities in allied fields, provide information regarding possible infringment or patentability of anticipated projects, and file applications for new patents as may be expedient.

Separation of development and laboratory work is advisable. In small organizations, laboratory work required in connection with development problems may be requisitioned, thus avoiding duplication of laboratory equipment. On the other hand, this interferes with the high efficiencies in routine control work obtainable in laboratories confined to highly routinized procedures without demand for special jobs.

Each piece of laboratory equipment should be purchased as its need is recognized in connection with the demands of the laboratory. No piece of apparatus should ever be installed simply because it is "standard laboratory equipment."

The physical testing laboratory should be maintained at standard atmospheric conditions, 65 per cent r. h., 70°F., with ample space for all physical tests and conditioning of samples.

It is also well to provide a room, or at least a chamber, in which the air condition can be varied through cycles under automatic control.

To supersede common organoleptic "tests" and judgment on such important characteristics as handle, drape, etc., new precise apparatus must be developed. A skilled instrument maker is a valuable adjunct.

In the dark room there would ultimately accumulate high- and low-power microscopes, projection and photographic equipment, etc.

The development divisions should be built around a nucleus of chemical and mechanical engineers. As the divisions grow, physicists, organic chemists, and other specialists may be added. In the larger plants, it may be well to give the specialists separate laboratories and assistants so that detail work may be pursued under personal direction. Suitable space should be available to the chemical engineers for preliminary trials on a "dish pan" scale or on semi-plant size equipment.

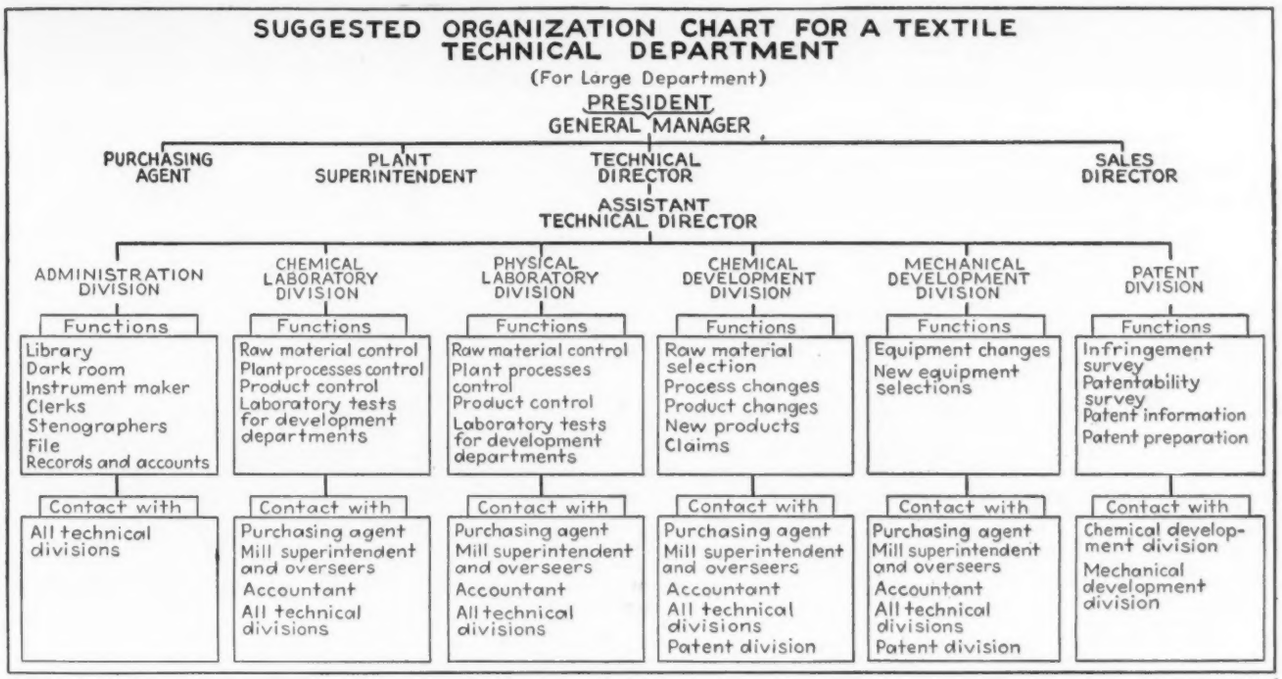
The mechanical development work should be headed by a well-trained mechanical engineer, supported by machine designers, mechanics and assembly men, some with practical experience with textile equipment, stimulated by others who have had experience in different industries.

With the smaller organizations, it is well to do much of the actual mechanical experimental work on production equipment. This assures the interest of the operating men during preliminary stages of a project. Some problems, where secrecy is important, or where the change is so fundamental that a great deal of trial work is required, are best solved on equipment set aside in the experimental department.

In general it is wise to requisition machine work from the plant shop, or nearby machine shops. This eliminates a large fluctuating experimental personnel inconsistent with the confidential nature of the work.

Textile equipment includes much high-speed machinery with revolving and reciprocating parts. Development work is greatly assisted by the intelligent use of high-speed flash photographs and observations with the stroboscope, vibration indicators, and the like. Use of the strobotac or similar device in the daily and hourly control of spinning equipment is essential in maintaining uniform twist.

As ideas form the basic raw material for development and research work, personnel so occupied should be encouraged to maintain outside contacts with their professional group and with men in associated industries. A generous subscription to periodicals of the textile and specialized trades supplying the industry and periodicals of general scientific interest encourage original thinking and the infusion of new ideas. Few manufacturing companies are convenient to large scientific libraries, making im-



perative the accumulation of a general reference library. Here again the accumulation should be gradual. The library should also include bound copies of all formal reports issued by the development divisions.

A good librarian responsible for review of the literature and efficient notification of the department members of current articles bearing on each individual's activities, together with a well-cataloged subject file covering notes, correspondence, and reports of the department, is invaluable. The use of a biblio film system for securing copies of articles not included in the regular periodical list, and for record files of machine layouts, patent information, etc., is highly recommended.

A technical organization is primarily an organization of men, and its limitations are the limitations of these men as individuals and their productivity as a group. Access to the greatest libraries and the fanciest equipment will not serve to assure the maximum return for a group of men of inferior training or without incentive to deliver their best. Obviously then the skill shown in the selection and handling of the technical staff controls its effectiveness.

Technical men, particularly those best suited for fundamental research, are highly individualistic, frequently introspective, and sometimes actually eccentric. Their selection is not easy. Their college grades, productivity under other environments, and personal appearance, are frequently of little help in estimating what a man may accomplish. These individualists must be organized to work together. In its outside relations, the department must recognize profits to the company as the paramount purpose of its existence, while creating for its personnel an atmosphere suitable for practical engineering, free research on fundamental truths, or high-speed repetition of complicated and precise determinations, as may be required by the individual or the job at hand.

Usually the utility of the control laboratory is rapidly realized. On the other hand, the productivity of a development or research organization may appear to be irregular, and particularly during the formative period results may be slow in forthcoming. It is imperative, therefore, that research work should be undertaken only when the management is prepared to support both the research idea and the selected personnel with funds, patience, and authority until there is adequate opportunity to demonstrate their value. In the textile industry, as in other industries with roots in primitive activities, the background of knowledge is superficial, with little information on fundamentals and practically no specialized equipment with which to study them. Therefore present development work must include simultaneously the application of temporary palliatives and the search for fundamental truths.

The testing activities may be considered as accident insurance or expenditures to avoid losses through chance variations or inferiorities.

The research and development activities may be considered as life insurance, expenditures to eliminate loss through chance that the organization, or even the industry, may be wiped out because its market is destroyed by superior technoligical advance of other industries, other companies, or other nations.

Provided with proper support, a research development and testing organization can pay handsome dividends in the textile industry by pointing the way toward a reduction of cost, improved uniformity in quality, and in the enlargement of markets. If on the other hand, this work is to receive only half-hearted support, or if the "laboratories" are acquired primarily for advertising exploitation, these funds might better be diverted to other channels.

NEW PRODUCT DEVELOPMENT AIM OF KENDALL RESEARCH

► In many industries, such as the dye and chemical industry, leading manufacturers believe that their research and development departments are as important to sustained profits as are their production and sales departments. Henry P. Kendall, president of the Kendall Co., has this same conviction. And in the textile industry his company is recognized as one which has obtained tangible results from research. Due to the fact that

the Kendall Co. owns a considerable number of plants on widely varied products of manufacture, the research and development work is organized and carried out in a somewhat different manner than would be the case with a company operating only one plant and on a small variety of products.

The Kendall Co. organization comprises three major divisions—the cotton mills division, the finishing division, and the Bauer & Black division. Each of these divisions has its own research laboratory or laboratories. This arrangement involves some duplication of facilities and talent, but has compensating advantages. In each division research and development work is budgeted separately from production and sales. Control is regarded as a function of the production departments.

The research laboratory for the cotton mills division is located at Paw Creek, N. C.; the finishing division has laboratories at Slatersville, R. I., and at Walpole, Mass.; the Bauer & Black laboratory is in Chicago. Activities of the divisional laboratories are coordinated through a central research, development, and patent department, with headquarters at the main office of the Kendall Co. in Boston.

The primary objective of the company's research, however, is the development of new and better products.

While a large part of the efforts of the research staffs is devoted to the development of specific types of new products, the company is also carrying out fundamental researches. While fundamental research is the most difficult to operate, in the long run it has proved to be most productive of results.

Recently Developed Fabric

Among the new and improved products developed by the Kendall Co. in recent years are included better and cheaper surgical dressings than those available a few years ago; a new type of diaper which is meeting with favorable public acceptance; and improved types of adhesive tapes, bandages, and absorbent cotton.

One of the most recently developed products is a soft, absorbent, lintless, woven fabric for use as a cleaning, dusting, and polishing cloth. This patented fabric, known as Rymplecloth, is particularly interesting because it demonstrates the way in which a textile manufacturer can adapt his products to entirely new uses. Heretofore, cleaning cloths usually have been made either from cheesecloth or from knitted fabrics. The latter have been favored because of their softness and bulkiness.

The problem confronting the Kendall Co. research and development department was to produce a woven fabric which would have the advantages of a knitted fabric, without its disadvantages. The problem was solved by processing a plain-weave, open-mesh, unbleached fabric in such a way that the warp and filling yarns assume sinuous or tortuous formations with loops, kinks, etc. During the process the fabric contracts in width and length; becomes five to ten times thicker than when originally woven; acquires considerable springiness and elasticity, together with the necessary softness; assumes a fluffed or bulked appearance, with a large surface area and the ability to pick up and occlude dust particles.

The basic fabric from which Rymplecloth is produced is quite similar to some of those which the Ken-

dall Co. has manufactured for many years for other purposes. In the development of the new product, however, it was necessary to determine what specific sizes and twists of yarns and what particular cloth construction would give the best results when the goods are subjected to the bulking process. The product has the further commercial advantage of coverage by patents.

In view of the fact that new product development is carried out mainly in the plants of the finishing division, it frequently is necessary to have experimental yarns, fabrics, etc., made up by one of the plants in the cotton mills division. Since each division has its separate budget, work done by one division for another is paid for on a cost basis by the division having the work done.

Research Meetings

Research meetings which are attended by members of the research staffs of the various divisions afford opportunities for interchange of ideas and for men from one division to learn what is being done in the other divisions. In addition, several research men are usually present at meetings of the sales department, etc. In this way, among others, the research and development department is kept posted as to company problems and policies. Since expression of the need for improvement of existing products or development of new ones may come from the sales or other departments, such meetings are of great value.

The company maintains regular appropriations for the purchase of books which are of fundamental reference value; and also encourages collateral reading, both by the purchase of books and current scientific publications. This is considered to be very important in helping the worker to grow at a pace commensurate with the scientific world at large. In fact, the company feels so strongly about this point that it would not care to keep a man who was not a diligent reader.

Arrangements have been made for the workers to use the important public and institutional libraries near their environment, an appropriate fee being paid by the company for this purpose. In undertaking any problem, the worker is supposed to exhaust the knowledge available in a library before undertaking original work.

Patents

The operating divisions are encouraged to take out patents. On their initiative, patent applications are prepared, then viséd by the research coordinating officer in Boston, are solicited by the division, and finally approved for issue by the Boston Office at the end of the period of solicitation. Believing that the inventor is always the best champion of his own idea, he is always kept in close touch with and participates in the drafting of the patent application and its solicitation, even though the actual work may be done by some one specializing in the field.

Officials of the Kendall Co. do not look upon research as a magic wand with which miracles can be performed. Neither do they consider that productive results can be obtained by relegating a man, however able, to some obscure location or relationship. On the contrary, they believe that research is an essential of modern industry and is one of the important tools by which the management will determine the future character of the business and its capacity to earn profits. Practical experience has proved, in this instance, that research can increase the efficiency of plants and can develop new and profitable products.

The Kendall Co., however, is of the opinion that successful research can only be conducted where there are adequate funds, a management background adequate for operating research, and a marketing organization suitable and available to capitalize upon such new developments as may appear.

Can a Textile Man Make Money?

YES, IF MODERNIZATION IS MADE THE WATCHWORD

PRACTICALLY all readers of TEXTILE WORLD are aware of the benefits of modern plants, equipment, and methods. They know that in those mills which are up to date throughout production costs are considerably less than in those which are cluttered with old and obsolete machinery. There is no need, therefore, to reiterate the advantages of modernization or to demonstrate how important modernization is from the viewpoint of profit possibilities. On the other hand, in the last year or so there has been an increased interest in planned modernization programs. Such programs are designed not only to bring a plant up to date, but also to keep it in that condition.

It is axiomatic that a definite plan of modernization will give more satisfactory results than will haphazard, unprogrammed steps taken as the result of some exigency. Accordingly, in the first of the following two articles, after outlining briefly the factors which make modernization necessary, we are summarizing three of the modernization plans which have proved particularly satisfactory in the textile industry. In the second article we are describing the way in which the American Hosiery Co. has adapted one of these plans to its specific needs.

WHY, WHAT, AND HOW TO KEEP UP-TO-DATE

By Howard P. Galloway
Assistant Editor, TEXTILE WORLD

▶ A number of different factors contribute to the need for modernization. Some of them can be guarded against and planned for; others, occasionally, strike without warning, but must nevertheless be accorded attention. The major factors are ordinary wear, obsolescence, inadequacy, and desire to improve working conditions.

Ordinary wear proceeds from the time a mill building or a piece of machinery is first constructed or put into use until the time it is finally junked. Proper maintenance is of considerable assistance in retarding wear, but sooner or later the point is reached at which the equipment cannot economically be operated and should be replaced.

Obsolescence is due to technological advancement—the development of something better. This is at present the most important reason why modernization is necessary.

Inadequacy is due to changed requirements. That is, property which may still be quite adequate for the purpose for which it was originally intended may, for one reason or another, have become inadequate or uneconomical to operate. This would be true, for instance, if a mill's productive facilities were expanded to a point beyond the capacity of its power plant, warehouse, or some other department. Again, it would be true in the case of a mill which because of changed consumer demands was forced to alter its product to such an extent that its existing equipment was no longer satisfactory.

Desire to improve working conditions is becoming an increasingly important factor. Major changes which have had as their incentive improved comfort, health, safety, and efficiency of employees include better lighting, adequate air conditioning, installation of safety devices and elimination of accident and other hazards, furnishing sanitary toilet facilities, etc.

What to Modernize

Any modernization program usually begins with the installation of up-to-date production machinery. Of perhaps equal importance, however, is the modernization of power-generating, power-transmission, materials-handling, and other auxiliary equipment.

Machine arrangement and materials flow are also very definitely subject to modernization. Rearrangement of machinery ordinarily is carried out in conjunction with installation of new equipment; however, machinery already in place is frequently susceptible to regrouping for the purpose of providing more working space, eliminating back-tracking or excess handling of materials in process, etc. At times, it may be desirable to move entire departments from one location to another, in order to obtain straight-line flow of work through the mill.

To obtain the maximum efficiency from modern machines and machine layouts, the buildings obviously must be well lighted; properly heated, ventilated, and humidified; and otherwise maintained in up-to-date condition.

There is a growing realization among textile men that, along with modernization of the physical properties of the plant, there is the necessity for modernizing production methods and production planning.

Three Programs

Of the various modernization programs which have been devised, three of the more basic will be described briefly. However, it is recognized that any modernization plan must be to some extent a tailor-made job. It may be necessary to select parts of two or more of the programs and combine them; or, in some cases, it may be desirable to devise an entirely new plan.

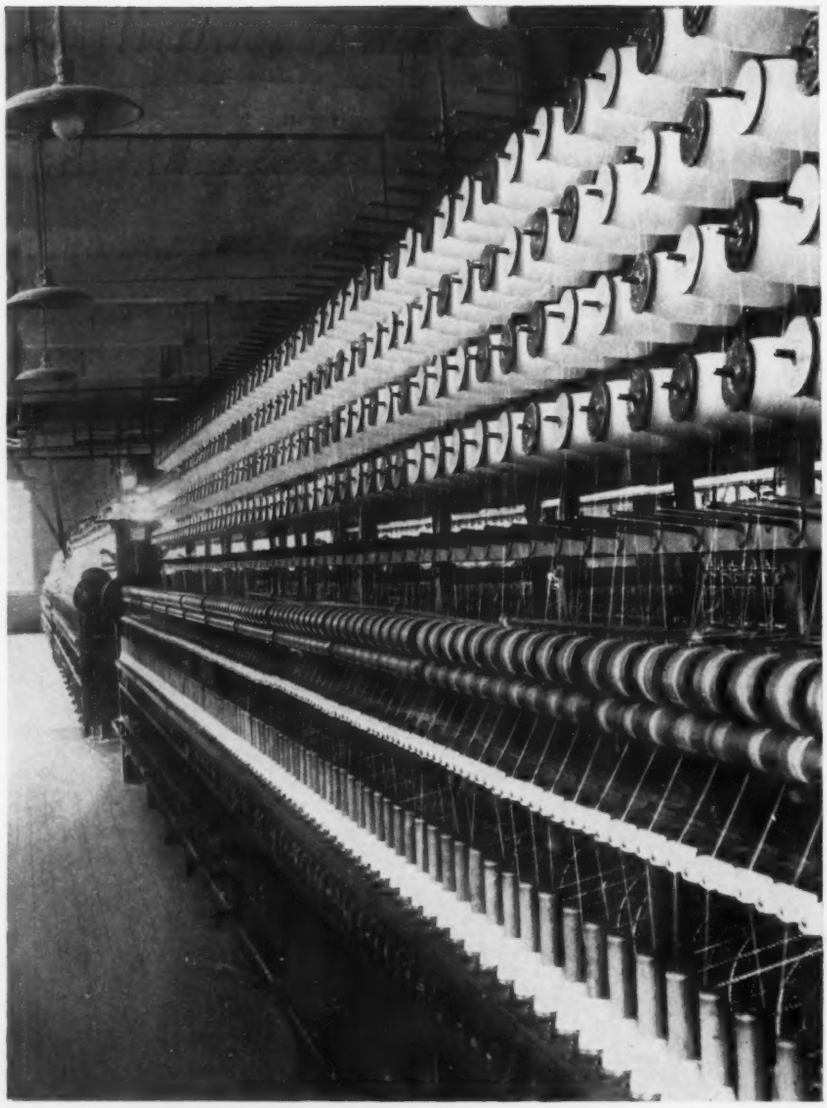
One program of modernization is to concentrate all attention on a single department of the mill, bringing it completely up to date. When the work in the first department is finished, a second department is selected. Then, all attention is concentrated on it. After the second department is completely modernized, a third is tackled; and so on, until the entire mill is in good shape. With this plan,

care must be taken not to throw the productive capacities of the various departments out of balance.

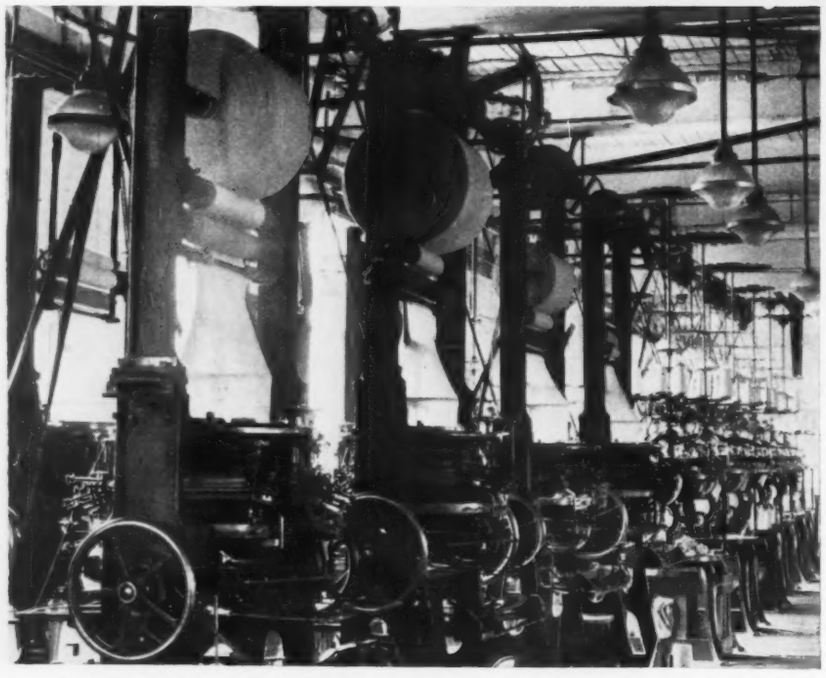
Another plan, which achieves the same result by a different method, is first to undertake modernization of the worst spot in each department. After these are eliminated, the portions of each department next most in need of modernizing are given attention. Gradually, the work is extended in each department farther and farther down the line, until the whole mill is in first-class condition. This plan is the one which is being followed in general at American Hosiery Co., as described below.

A third plan calls for a recurring cycle of modernization, so that all parts of the mill are at all times up-to-the-minute. According to conditions in the mill adopts it, this may be a 2½-year plan, a 3-year plan, a 5-year plan, and so on. The 3-year plan is perhaps the simplest to illustrate. During the first year of the cycle, carding and spinning operations, for example, are modernized. In the second year, warp preparation and weaving or knitting departments are brought up to date. During the third year of the cycle, the dyeing and finishing processes are brought into line with modern practice. In the fourth, fifth, sixth, and succeeding years the cycle repeats itself. Thus, every department of the mill receives whatever modernization attention it requires at intervals no greater than three years in length.

Some companies which have continuous modernization programs have inaugurated them by carrying through Plan No. 1—bringing the various departments up to date, one after the other—and then have put into effect a cycle plan to keep them modern. Other manufacturers have found it advisable to eliminate some of the sorer spots throughout the mill, and then proceed to some recurring-cycle plan. Still other concerns have combined all three plans by eliminating the worst spots throughout the mill; then bringing the various departments up to date, one by one; and, finally, adopting a recurring-cycle program to keep the mill in modern condition.



Twisters at American Hosiery Co. were overhauled and put in first-class condition



In parts of the knitting departments at American Hosiery Co. Holophane lighting units were installed to give high-intensity light at the needles and diffused light on other parts of the machines

A Good Investment

In general, textile men believe that to be a good investment a new machine should pay for itself within five years. With some types of equipment, such as are employed in making certain highly styled fabrics, only one year is allowed; with other types,

used for the most stable lines, ten years is the upper limit. Various formulas have been evolved for determining how long it will take for a machine to pay for itself. Probably the simplest formula, and one which is accurate enough for practical purposes, is the following:

$X = C \div (S \times U) - (C \times I) - (C \times D)$

In this formula, X equals the number of years a machine will require to pay for itself; C, the cost of the new machine, including price, installation cost, and book value of the machine it replaces minus the scrap value of this machine; S, the savings per unit which the new machine will make possible; U, the units per year which will be produced on the new machine; I, the interest rate on the money which will have to be paid for the new machine; and D, the depreciation rate at which the new machine will be charged off.

If a textile manufacturer makes modernization his watchword and adopts a definite plan which will bring his mill, machinery, and methods up to date and keep them in that condition, he will have taken one of the vital steps toward putting his plant on a profit-making basis.

HOW AMERICAN HOSIERY CO. MODERNIZES FOR PROFITS

▶ Organized in 1868, American Hosiery Co., New Britain, Conn., has from the beginning had an enviable record as a progressive and profitable enterprise. One factor which has contributed to the continued prosperity of the company is that successive managements have always followed the avowed purpose of John B. Talcott, founder of the company, "to make everything wanted in the higher grade of knit goods and everything the best of its kind." A second factor is that constant efforts have been made to keep equipment, manufacturing methods, and merchandising policies up to date.

Over 20% of the older Terrot knitting machines were replaced by most recent models of the same make

At the time the American Hosiery Co. was founded, the word "hosiery" was commonly applied not only to stockings, but also to all other types of goods made by the knitters' art (as it still is in England). Today Amho Knit products include a complete line of men's and boys' high-grade knitted bathing suits, sweaters, underwear, and men's wool half hose. The company has always kept away from the manufacture of fabrics falling in the highly competitive lower-price ranges.

When the company was first established, a new mill was built and equipped with the finest machinery which could be obtained in this country or in Europe. Subsequently the company expanded, new departments were added, other buildings were erected. From time to time machinery became obsolete, was consigned to the scrap heap, and replaced by what were then the latest types.

About three years ago Roger W. Whitman, now president of the company and then vice-president in charge of plant and production, decided that the time was ripe for further modernization of machinery, equipment, plant layout, methods, and merchandising policies. Accordingly, a complete survey was made of the existing manufacturing facilities and merchandising set-up. As a result of this survey, an extensive modernization program was started.

The buildings themselves, although not in accordance with the latest ideas in mill construction, were, in general, in good condition. Therefore, the major part of the work to date has consisted of revamping and replacement of old machinery; rearrangement and consolidation of departments; installation of up-to-date lighting, humidification, and other auxiliary equipment; inauguration of a unit system of wage payment based on job analysis and time studies; and a revision of merchandising policies.

The wash room, in which the scouring and bleaching operations are carried out, was completely remodeled to give straight-line flow of work. In this room, the Sargent wool washer employed for scouring raw wool was brought up to date by addition of the new type of inverted pans. For scouring and bleaching cotton garments, American Laundry Machinery Co. wash wheels installed a few years ago were found to be in excellent condition, needing no repairs. A Hurricane dryer formerly located on the floor above was moved to a more convenient location adjacent to the wash room and was re-engineered to give more efficient air flow, and quicker drying, less distortion, and better conditioning of the goods.

To obtain a superior finish impossible with hand ironing, American Hosiery Co. makes it a practice to board and press every pair of the better grades of drawers and shirts. Like the dryer, the boarding and press room was moved to the same floor as the wash room. At the same time, the presses were insulated to provide better working conditions.

In the carding, combing, and spinning departments, all cards were reclothed, a new Tunstall comber was added to balance the cards, a new Whitin speeder was installed, and a new battery of Foster No. 75 winders was put in for skeining and unskeining yarn before and after dyeing. The ring frames used for spinning cotton yarns and the mules employed for

spinning cotton-and-wool yarns were thoroughly overhauled.

Equipment in the underwear knitting department consists of Cooper, Scott & Williams, Terrot, and Wildman machines for producing various types of rib, flat-stitch, flat semi-rib, and mesh fabrics. In this latest modernization move about 20% of the older Terrot machines were replaced by most recent models of the same make. These are circular spring-needle machines, making a variety of plain and fancy fabrics, including plated styles. They are operated by an overhead girder drive, and a drum underneath the machine serves to take up the fabric. It is believed that this is the only installation in this country of this particular type of equipment.

Over 60% of the productive equipment in the outerwear knitting department was replaced by new Swiss Dubied machines for knitting sweaters and other sportswear.

In both the underwear finishing room and the outerwear finishing room tables were rearranged to prevent back-tracking of work. At the same time, two stock rooms which previously were in separate buildings were consolidated. The new stock room is located in the same building as are the finishing departments, being directly above the underwear finishing room and directly below the outerwear finishing room. Likewise, the shipping departments were consolidated with the new stock room. Offices were rearranged, and the display room was moved to a convenient place near the office reception room.

The same attention was paid to auxiliary equipment as to productive machinery and plant layout. For example, every motor in the mill was surveyed from the standpoint of load and power factor, and such changes as were necessary were made. Belt guards were put in throughout the plant for the purpose of preventing possible accidents to employees. Telephones equipped with signal horns were installed on every floor, and electric clocks were put in each department. From the spinning room through the knitting department the mill was completely equipped with Bahnson humidifiers. The plant was repainted from top to bottom, with the exception of two rooms which have not yet been finished.

A careful study of lighting led to the modernization of lighting arrangements in the knitting department, cutting departments, and finishing rooms. In parts of the underwear and outerwear knitting department, for example, Holophane lighting units were installed to give high-intensity light at the needles and diffused light on other parts of the machines. These are spaced 6 ft. apart and are 7 ft. from the floor. Again, on certain types of knitting machines lamps were placed inside of the machine in such a way as to permit the operators to examine the fabric as it comes down from the needles. In the finishing departments the new lighting system consists of incandescent lamps so arranged as to prevent shadows.

Installation in the power plant of Bailey boiler meters resulted in a 13% increase in the efficiency of the boilers, and installation of a 10-bank General Electric capacitor so improved the power factor that with an engine which was formerly overloaded there is now a 10% margin over peak load. In addition, new vacuum and new water pumps were added to the power plant equipment.

In conjunction with the modernization program, the first-aid room was redecorated and some new equipment added. Likewise, a large recreation room for employees was refinished. There are approximately 200 employees in the plant, and a large number have been there for many years: Samuel Grocock, the chief engineer, is the veteran, now rounding out his 63rd year with the company.

Time studies of all operations in the finishing department were followed by the adoption of a unit system of wage payment. Under this system operatives are paid on the basis of units of work done, rather than on the basis of dozens of garments. For example, if the study showed that an average minimum work-load is 60 units per hour, the output of each girl during any given week is expected to average at least 60 units per hour. Many individual operatives are able to maintain a considerably higher average, and their pay is proportionately greater than the minimum established for 60 units or less. The forelady receives a weekly bonus, the amount depending upon the efficiency of the department as a whole for that week. In order to encourage the speediest workers to exert their best efforts, the management guaranteed, when the system was put into effect, that no change would be made in a piece rate once established.

The full effect in dollars and cents of the modernization work completed thus far cannot yet be computed. Some idea of the benefits can be obtained, however, from two examples. Consolidation of departments has resulted in a saving of 20% of floor space, with no loss of productive capacity. Some of the space saved has been leased to a machine shop; some of it has been rented to other companies and is bringing in additional revenue. Installation of humidifying equipment has resulted in a more elastic and better-running yarn and has increased the efficiency of the knitting department by at least 30%.

Finally should be mentioned three important changes which American Hosiery Co. has just made in its merchandising policy. First, it has redesigned its labels and box wraps to make them more attractive and distinctive and to emphasize its trade mark AMHO KNIT. Second, it has rounded out its line of products to give a more complete range; one addition is a line of guaranteed mothproof sweaters. And third, without lowering quality, it has built each line to fit into today's department-store price brackets and to permit the store to make its standard 43% mark-up on each number in the line.

Mr. Whitman's philosophy as regards modernization can be summed up in a few words: "To make the best of products at the lowest cost, the best of equipment is required. It is our policy to make only high-quality products. With our modern equipment, methods, and merchandising policy, we are in a position to make these products at a cost which permits a profit and thus insures the continued prosperity of the company."

Tables in the finishing rooms were rearranged to prevent back-tracking of work and a new lighting system consisting of incandescent lamps so arranged as to prevent shadows was installed

Annual Overseers' Corner

CHECKING UP

ON PETE AND BILL

In response to demands from our readers we persuaded Pete and Bill to return to these pages in April, 1938. This was a tough job, and we had to raise their salaries before they would leave Florida at the height of the fishing season. But now they are back with us for good, we hope.

There is no doubt that Pete and Bill, with their crusty arguments, occupy a warm spot in the hearts of our readers. This is proved by the large number of letters received each month commenting on the various discussions.

And since one of the chief functions of this *Annual Number* is to review statistically the various branches of the textile industry each year, we have decided to include Pete and Bill in our checkup.

The total number of letters received commenting on the various discussions is considerable, but there was a distinct variation in number from month to month. The most popular topics dealt specifically with personnel problems as related to employees, and the least popular topics in general were allied to individual or personal problems of the overseer. However, it is also significant that the greatest volume of letters were written during the warm months.

Following is a summary of the various topics by months of publication and a breakdown of their percentage ratio to the total letters received.

"The Absent-Minded Superintendent." (April) The superintendent absent-mindedly forgot to send through supplies requested by Pete, and later blamed him for bad work due to his own oversight. Bill suggested "putting it in writing." This was the first discussion after the return of Pete and Bill, and its part of total letters received was 5%.

"Ambition vs. Complacency." (May) The problem of how to inspire capable young men who seem satisfied with a mediocre job was suggested by the superintendent of a large group of mills. It must be a universal problem because more letters commenting on this topic were received than on any other. This discussion drew 24% of all the letters.

"Classifying Ability." (June) Pete suggested keeping a written record of good and bad points concerning each employee so that he would have concrete facts when considering promotions. Bill scoffed at the idea. This discussion was second in popularity during the year, receiving 19%.

"Personnel Departments." (July) Bill objected vigorously to the "new-fangled" idea of a personnel department on the grounds that he knows his business and wants to hire and fire the men who work for him. Pete said the department would save him time by keeping stray applicants for work out of his way. Proportion of total comments was 11%.

"Scouts in Other Mills." (August) Pete was stuck trying to get out a new product, and Bill advised him to send a man over to the next mill surreptitiously to learn how to do the job. Pete refused on the grounds that the practice is unethical. While this discussion did not bring in the volume of letters that some of the others produced, it created a greater intensity of interest and division of opinion than any other. About half of the writers favored sending scouts to other mills; the other half branded it as "theft." This topic received 13% of the total letters.

"Who Should Do the Buying." (September) Bill had been buying certain supplies from old man Brown for 20 years and raised quite a ruckus when a central purchasing department was installed. Pete favored the department because it keeps salesmen out of the mill. This discussion accounted for 10% of the letters.

"Protection From Loan Sharks." (October) Pete got highly incensed at the loan shark who was taking advantage of his employees, and threatened to run him out of town. Bill said it would be just a little while until another made his appearance; and the workers would resent interference anyway. Opinion on this was sharply divided, but the return was only 5% of the total.

"Time Out For Relaxation." (November) With the passage of the Wage-Hours Law, Pete decided to eliminate all time-out for smoking, sandwiches, etc., in order to get the maximum production at the higher wage. Bill said the employees would take time off anyway, so why not continue to give it to them. About half of the writers favored relaxation periods and the other half asserted that the employees, especially piece-rate workers, do not need or want rest. Proportion of the total return was 8%.

"Overseers' Meetings." (December) Bill condemned overseers' meetings as being a useless waste of time, but Pete said he finds them stimulating. Concensus was that well-planned meetings at not too-close intervals are worthwhile. Returns amounted to 5% of the total letters received.

PRACTICAL HELPS

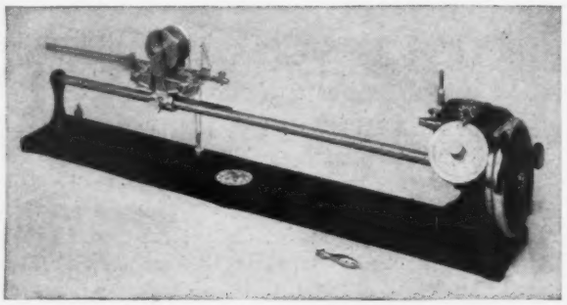
for Operating Executives

CULLED FROM THE 1938 ISSUES OF TEXTILE WORLD

Kinks for Cotton Overseers

In the cardroom, all cards should be given an annual overhauling. Bearings must be realigned in the most careful manner; all plates and screens are removed, cleaned, polished, and reset; the lickerin should be given the special attention which it is sure to require—including straightening or replacing teeth that are damaged, and regrinding. Top flats should be machine-ground to put them in uniform condition, each flat being ground to the same gage and made even from end to end. All working parts,

SCOTT Motor Driven Twist TESTER



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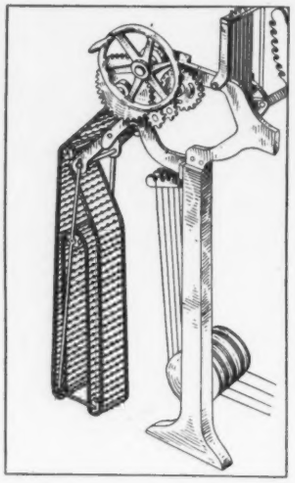
PRACTICAL HELPS...

. . . for OPERATING EXECUTIVES

gears, and shafts must be repaired and reset.

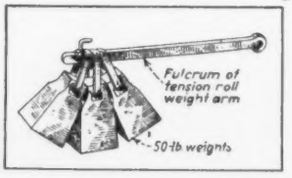
A chain rack for use on Gem head motions where looms are crowded can be constructed by



Chain rack for looms

drilling holes in ⅛ in. x 1 in. strap iron at intervals for different chain lengths. Other material needed is round ¼ in. stock, eight cotter pins, and three chain rollers with holes all the way through. The ¼ in. stock is run through the chain rollers and strap iron. This rack is particularly useful on Gem head motions using patterns of 150 bars or more.

Former practice on certain beamers was to hang three or four large weights at the ends of the tension-roll weight arms, these weights being necessary because of the heavy goods be-

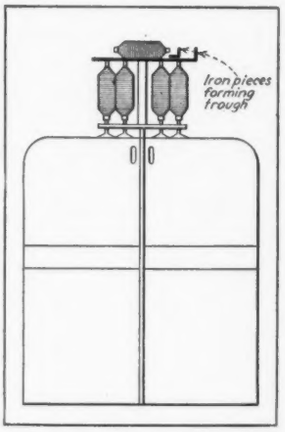


To prevent weights from falling

ing run. With nothing to keep them from falling off, these weights constituted an accident hazard. As shown in the accompany sketch, this hazard can be eliminated by drilling a hole in each arm, and inserting and securely bolting on a ¼ in. rod threaded and bent to form a hook.

In the picker-room, machines should be dismantled at least twice a year. This calls for a realignment of all bearings, a close inspection of all parts connected with the evener-motion, inspection of feed rolls to make sure the flutes are in good condition, examination of the beaters to see whether the edges are getting rounded and need to be reversed or repaired, conditioning of cages or screens so that the edges are as good as new, checking up on calender-rolls, and attending to fans and flues.

As an aid to collection of roving bobbins, place along the edge of the spinning-frame creel board a trough constructed from two pieces of iron, as shown. At the end of the frame, where the wide alley is located, place a sheet-metal funnel or hopper arranged to empty into a can. The roving



Trough for roving bobbins

hauler simply runs his hand along the gutter, pushing all of the bobbins into the hopper at the end of the frame.

Reliable tests have shown that in the case of 20s warp yarn the breaking strength ceases to increase when turns of twist per inch exceed 4.75 times the square root of the count. A mill producing large quantities of warp yarn should have in its spinning room a comprehensive chart or graph showing breaking strength of a count of yarn at various twist constants. Start with twist equal to two times the square root of

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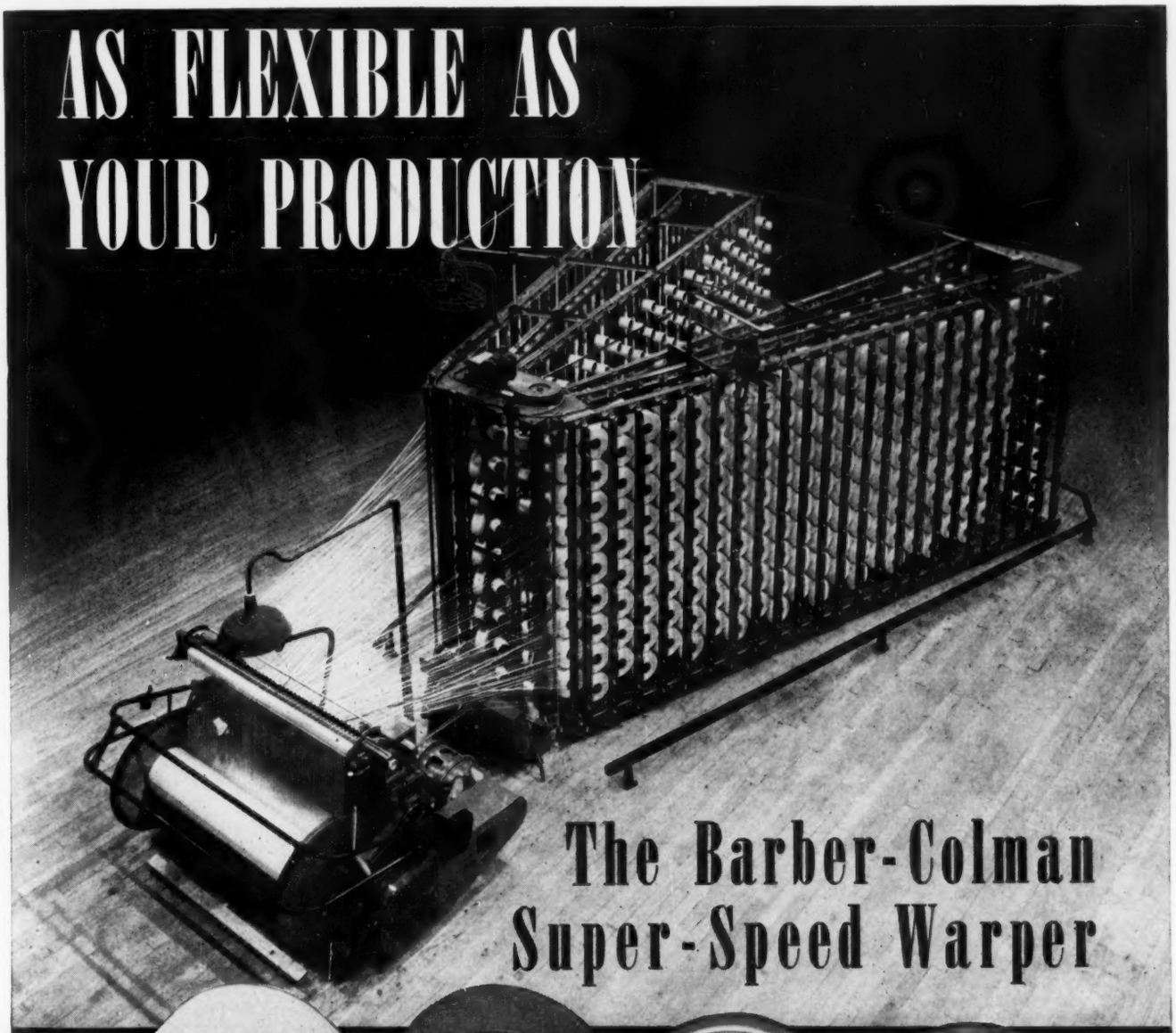

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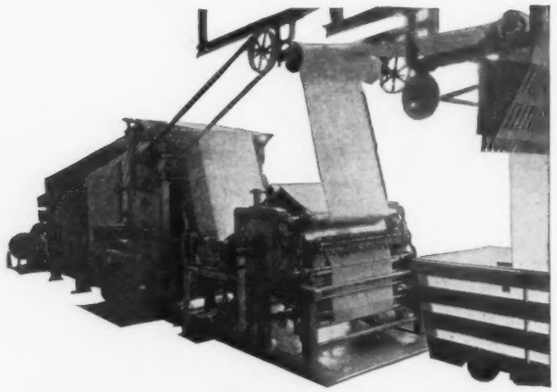

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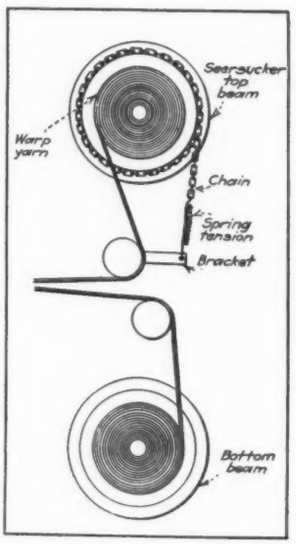
PRACTICAL HELPS...

the count and work up to twist equal to 5.5 times the square root of the count. Marginal notes should specify the type of cotton used and the machine settings. When machines are running in accordance with the results of the tests, they are operating at maximum speed and producing yarn of highest possible breaking strength, with specific twist constants insured.

There are five major causes of failure to produce good picker laps: (1) abnormal or subnormal moisture content; (2) too much variation in fiber length; (3) poor cleaning; (4) improper mixing and blending of stock; (5) not putting the same amount of reworked waste in each lap.

It is common practice to hang the seersucker stripe as a top beam and control the amount of let-off by springs. It is also common practice to hang such a top beam wrong, and have yarn pull from a dead weight, against all principles of correct leverage. Hence, the reason many mills hesitate to accept orders for this type of

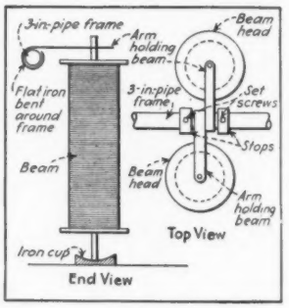


Hanging seersucker warps

seersucker-stripe fabric. The accompanying sketch shows how a seersucker warp should be hung, and the location of the tension springs. It is better to use a series of light springs rather than one heavy spring.

It is common practice to scour the rolls of spinning frames from time to time. While this is being done it is good judgment to level and realign all bearings, with special attention to the roll stand and roll bearings.

A rack to hold loom beams until they are ready to go into the loom is shown in the accompanying sketch. It has a frame of 3-in. iron pipe, bolted firmly to the floor. At regular intervals arms made of flat iron extend to either side. Each of these is attached to the pipe by means of a loop bent in one end; it is so arranged that it can be raised to receive a beam, then lowered again. One end



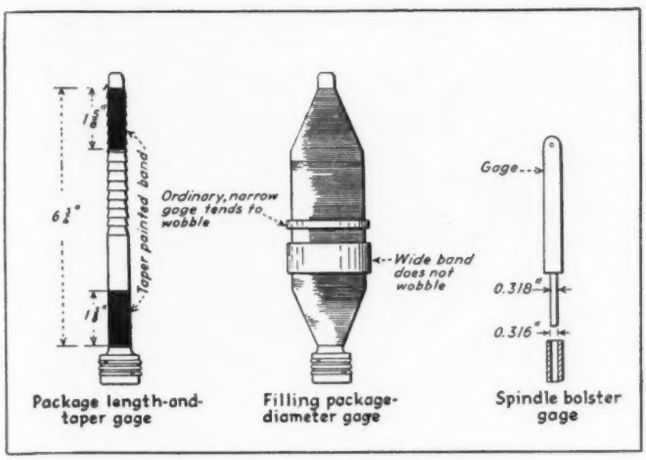
Loom-beam rack

of a beam is placed in an iron cup fastened to the floor and the arm of the rack lowered over the other end so that it holds the beam firmly in an upright position. Arms are kept from sliding laterally on the pipe by means of stops setscrewed on each side of each pair.

The sketch on page 115 shows three gages for spinning-room overseers. The first is a master bobbin used to gage the size and build of warp yarn. This consists of an ordinary bobbin on which have been laid out the correct distances for a perfect package of the size and type desired.

Diameter of filling package is gaged in many mills by slipping over the full bobbin a metal ring of the desired size. It is advisable to use a comparatively wide band for this purpose, as shown, since the narrow band tends to wobble slightly and does not cover

. . . for OPERATING EXECUTIVES



Three gages for spinning-room overseers

enough surface to be entirely accurate.

When checking frames for the purpose of overhauling spindle bolsters, a piece of metal with a diameter the slightest bit larger than the desired bolster size is employed as a gage, as shown in the accompanying sketch. If this gage slips easily into the bolster, the bolster is worn to the point that it needs overhauling.

•

Kinks for Wool Overseers

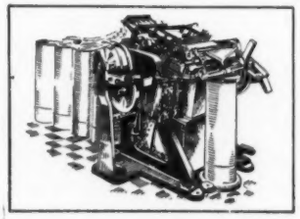
Sometimes a box-lifting chain, through long use, becomes worn at each place it contacts a sheave. The simplest remedy for a situation of this kind is merely to turn the box-lifting chain over. If this has already been done, a good method is to place a wire staple on the chain in such a position that the staple will be riding on a sheave when the low box comes into position. If neither of these remedies works, the thing to do is to secure and install a new chain.

In piece-goods carbonization, when a 5-oz. dress fabric follows a 20-oz. velour coating, great flexibility in control is needed. The practical solution in such cases is to cut the acid in the impregnating bath with water to 1½ or 2% as soon as the light piece enters the tank. It may often be necessary to open the machine doors as the light pieces reach the middle of each oven. Reducing the concentration of the sulphuric acid slows up carbonizing, and at the same time is a protection to the wool fiber.

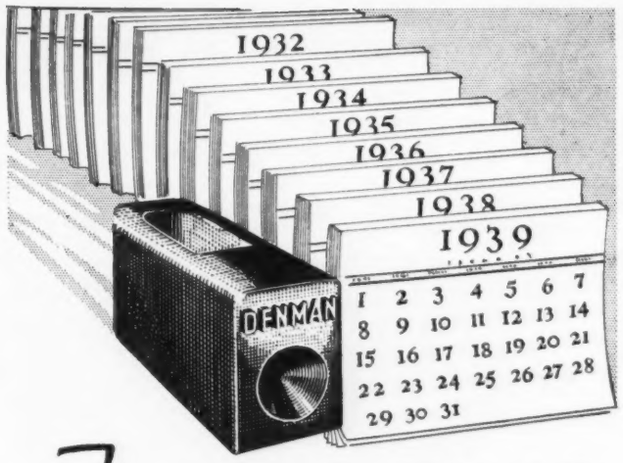
Factors which affect top and noil ratio include: first, the position of the feed knives; second, the distance of drawing off rolls from circles; third, the character of the wool as it comes to the comb.

It is important that loomfixers take extra care of vibrator gears and have some regular system of replacing vibrator runs on the vibrators. An entire set of vibrators should be kept on hand, and these should be changed as sets, not individually. The vibrators removed should be examined closely and repaired with new runs wherever these are necessary.

Neppy work from French combs which shows in the head end of each fringe or draw may be due to several causes:



Causes for neppy silver



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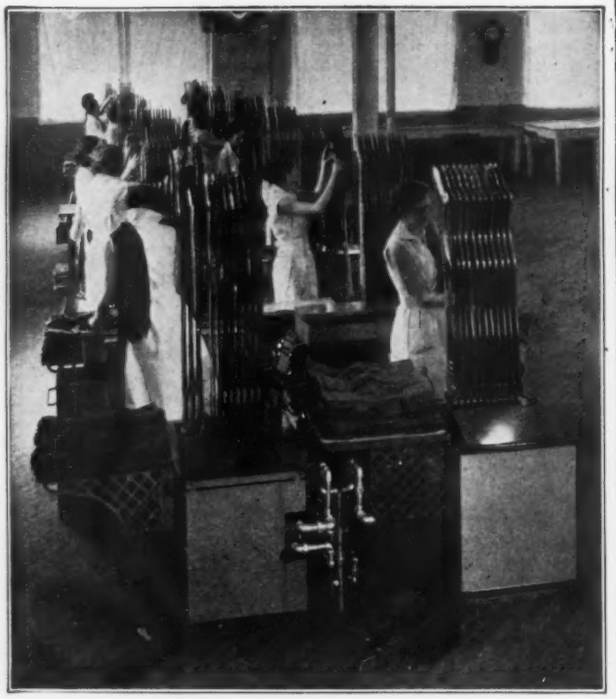
1000 DOZENS DAILY

HOSIERY FINISHING



A PRODUCTION in excess of 1,000 dozens full fashioned ladies' hosiery is being finished daily on the 13 PARAMOUNT DUAL HEAT MACHINES operated in this mill during one eight-hour shift—and the character and quality of the work is incomparable since the PATENTED DUAL HEAT principle of drying is positive protection against "baking" delicate silk fabrics. Not only does the PARAMOUNT DUAL HEAT MACHINE contribute outstanding features of production and quality, but it represents—

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2. A minimum of floor space occupancy
3. Less power and steam consumption per dozen
4. Ideal room and working conditions
5. Less maintenance
6. Ease and comfort to the operator
7. Simplicity and durability of construction

Any one feature alone, of the numerous advantages which the PARAMOUNT DUAL HEAT MACHINE offers, will justify a change to this superior method of hosiery finishing.

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Furnished on SALE or RENTAL Plan.

PARAMOUNT TEXTILE MACHINERY CO.
538 South Wells Street Chicago, Illinois

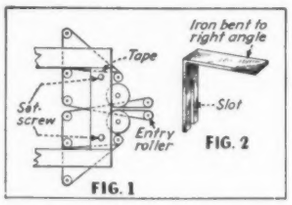
PRACTICAL HELPS...

the setting of the nip to the cylinder may not be close enough; the dabbing brush may be worn or not set deep enough; the burr knife may be out of action; the finisher segment may not be fine enough, or, if it has not been changed, it may be defective; the brush may be out of thrust.

On heavy pieces which follow light material, the carbonization bath should be brought up to about 4%. Speed should be reduced, but the temperature should not be raised until the last end of the light pieces is about half-way to the baking chamber.

On warps made from woolen yarn with rayon decoration there was too much breakage of the rayon yarn. The rayon heddles were worn in the eyes and let the ends slip down into the grooves and break. To correct the trouble, the loom-fixer picked out some heddles not worn for the rayon, then put the rayon on the two front harnesses (instead of back, as previously). Stirrups operating rayon harnesses were raised higher on the jacks than the others; this moved the rayon both higher and lower than the wool and buried it in the woolen yarn so that shuttles could not touch the rayon.

When the edge tape of a new set of tapes has been stretched by wool which became wrapped underneath the tape around the entry roller, an easy repair can be made by first bending a piece of ¼ in. x 1½ in. flat iron into a right angle, then cutting a slot in one extremity



Device tightens edge tape

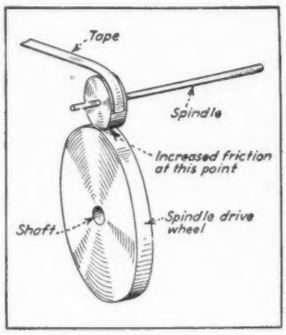
of the bracket so formed. The bracket is next attached to the card, by utilizing either of the setscrews shown, in such a manner that it presses on the stretched tape. The iron can be made any length or shape desired, to enable the tape to pass over it without undue friction.

In the production of worsted yarns of very light shades, say 50s quality tops, spinning 1/24s yarns, with about 1¼ lb. black to 98¾ lb. white, it will aid in eliminating streakiness to use a higher quality stock, say 58s, for the 1¼ lb. of black with the same 50s quality white. The reason for this is probably that the increased number of finer fibers spreads better and allows more uniform distribution. The increased cost is negligible.

•

Kinks for Rayon-Silk Overseers

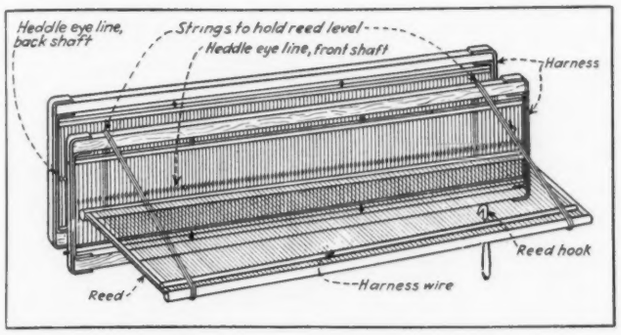
Often loose or poorly wound bobbins are due to a winder spindle which may have collected a small amount of grease or may be too light to pull the skein at the proper speed. To overcome these slow-moving skeins and give the winder spindle more speed and pulling power, a strip of electrical tape is wound around the spindle, as shown in diagram, and cut off to leave an even surface. Increased pulling power is obvious.



To increase pulling power

It is possible to prevent sprung dents, which are often made in pitch-band reeds when reeding with hand hooks. Elimination of the trouble requires keeping the hooks away

. . . for OPERATING EXECUTIVES

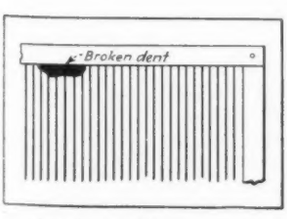


Device helps prevent sprung dents

from the space wire and near the center of the reed. By placing a length of harness wire along the reed, as shown, the knives are prevented from coming too close to the space wire. The wire can be held closer to the center of the reed by tying a string around each end and in the middle, making easy adjustment to position for centering the reed hooks.

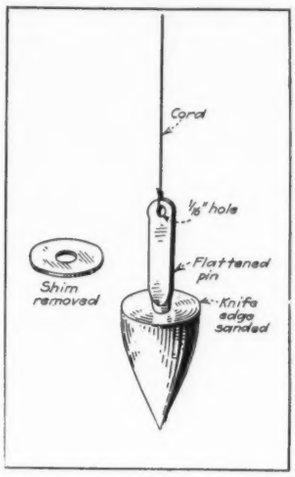
For winding douppioni crepe so that it will give the least trouble, use an unrolling supply package; wind, if possible, to a cone-base bobbin or quill; use as short a traverse as possible; three wind—three turns around the bobbin for each stroke of the traverse—will give best results, laying the coils across each other instead of parallel.

If a reed dent is broken completely off along either top or bottom, a small piece of chewing gum about the size of a pea is worked into the dents as close as possible to the reed-space spring, so the gum will be along the back as well as the front of the reed. When worked into place, it must be tacky; as the gum hardens, the broken dent is held firmly in place. It is not necessary to leave a loom idle for a shift or more merely because of a broken dent to be repaired, providing the fixer understands this kink.



Quick reed-dent repair

In lining up winders, quillers, and other small shafting, as well as different working parts on looms, a small plumb bob made from an old shuttle point comes in handy. Split the wood or fiber back of the steel point in order to release it. Then remove the fiber or brass shim from the point, and smooth down the knife-like edge, at the highest part, on the sander. Next flatten the pin, center punch, and drill a 1/16 in. hole through the pin. A heavy linen thread, a piece of fish line, a piece of lease cord, or other strong thread is used for the plumb line.



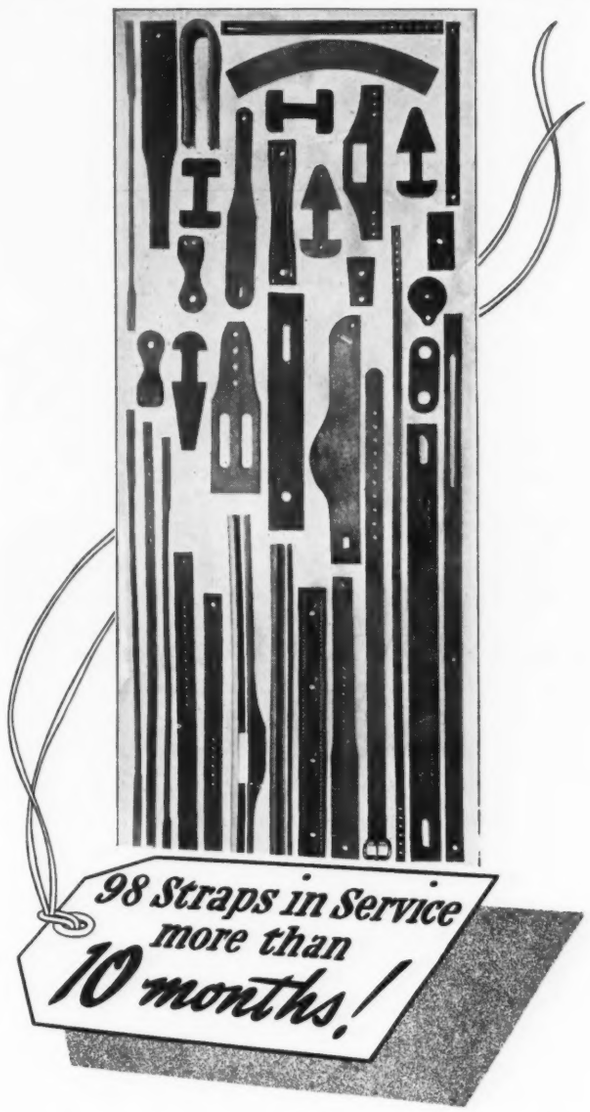
Plumb bob from shuttle point

The resins used for crease-proofing or crushproofing velvets tend to resist the majority of dyes. To redye such fabrics, it is best to remove the resin either partially or completely. This is done by treating for 20 min. at 180 to 190° F. with a ½% solution of hydrochloric acid. It is recommended to add a small amount of some

RHOADS

TANNATE

SPECIAL CHECK STRAPS



In a southern mill 100 Model X Looms were equipped with Rhoads TANNATE Check Straps. *Ten months later,* inspection of these looms (making approximately 200 picks a minute on double shift running) showed only two check straps had been replaced. 98% of the installation was still taking punishment with no trouble, no replacements, no lost production time!

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FADE-OMETER Color Test

Here Illustrated

● This dyed purple fabric was exposed in steps in a Fade-Ometer. Side strip is unexposed color; A to F are consecutive exposures.

A had	3	Fade-Ometer	Hours	
B "	6	"	"	"
C "	9	"	"	"
D "	12	"	"	"
E "	15	"	"	"
F "	18	"	"	"

The Fade-Ometer shows you in a few hours just how any dyeings will act when subjected to regular usage in sunlight.

Launder-Ometer will tell the other story. How will a fabric wash? Will it stand the strain of commercial and domestic laundering?

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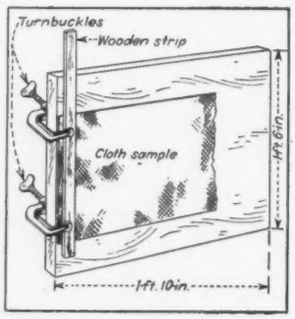
T.W.-39

PRACTICAL HELPS...

. . . for OPERATING EXECUTIVES

wetting-out agent to the acid bath, as the resin often tends to make the velvet somewhat resistant to wetting.

A small inspection board made from a piece of 5-ply wood presents an excellent aid



For analyzing samples

to dissecting and analyzing samples. The board utilizes a thin strip of wood or metal to hold one side of the cloth. As shown in the sketch, two half turnbuckles can be used for tightening.

Variation in tension of the ends across a rayon warp, which results in an appearance of light and dark ends in the warp of the fabric after dyeing, is usually the result of improper warping of the section beams, in the cotton system; or the warp beam, in the silk system.

To present shiny picks in 5-harness satin, in some instances the fabric is woven face down; that is, four down, one up, instead of four up, one down. There are two advantages to this: first, if there are any shiners, the weaver can see them as he is weaving; second, the filling is held up out of the feeler wire slot much more when there are four warp ends down to each one that is up.

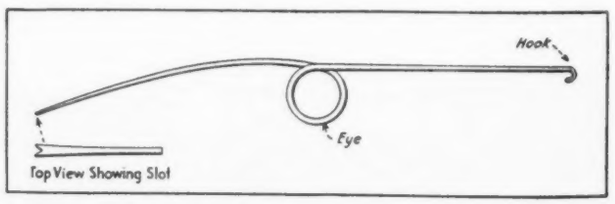
Kinks for Knitting Overseers

A simple, efficient method of saving full-fashioned-hosiery-machine chain links is to drive several sets of two nails each into the wall of the machine shop, just far enough apart to permit chains of various lengths to be slipped over them easily. Enough nails should be inserted to take care of individual pieces of chain containing from two links on up; 5-in. nails are recommended, as this length will allow at least a half dozen pieces of the same length to be kept in place.

In case of a hole, a cutter of knitted fabrics can do any one of three things. First, he can overlook it entirely, and permit production of a garment which will be rated a second. Second, he can cut the piece of cloth off to the hole and make unnecessary waste. Third, he can turn the piece so that the imperfection will be cut out of the lay-up or placed in such a position that it will not matter.

All tuck-stitch knitting machines should be run at the same diametral revolutions per minute so that the amount of yarn drawn from the cone during any given period will remain constant regardless of the diameter of the machine in question. A good average speed for tuck-stitch machines is 620 diametral r.p.m. To determine actual revolutions per minute at which any machine should be run, divide 620 by the diameter of the machine.

Much time and effort can be saved in threading yarn carriers by the use of the tool described herewith. A piece of



Yarn-carrier threader made from tension wire

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ONGER SERVICE
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PRACTICAL HELPS...
. . . for OPERATING EXECUTIVES

tension wire about 7 in. long is twisted in the middle to form an eye. Both ends are flattened; a small hook is formed on one, the other is slotted. It is important that the ends be small enough to pass through the eyes of the carrier and snapper.

Shafts and stud bearings on circular hosiery machines are equipped with oil holes. Fitting these with a high-pressure-lubrication device is not difficult or too expensive. The fitting is equipped with a spring-and-ball valve, which allows grease to pass through, but closes immediately when the pressure of the gun is released, thus preventing grit from getting into the bearings. Much time, lubricant, wear, and power can be saved by equipping these and certain other of the bearings for pressure lubrication.

When producing spring-needle, circular-knitted fabrics made from blends of spun rayon, wool, and mercerized cotton yarns, the most important factors in production of clear fabrics are to have a well-balanced stitch and to have all stitch wheels and pressers adjusted so they are casting off clear sitches. Many times landing wheels are not set in the right position under the pressers, or cast-off or cloth wheels are set too far away from the landers.

•

Kinks for Processing Overseers

In finishing fine-quality, yarn-dyed worsted serge cloth it is advisable to steam the fabric between decating and pressing to remove any lay marks which may have formed.

Colors which have been scraped out of the boxes at the printing machine are obviously somewhat dirty. These colors are far too expensive to be thrown away, yet they cannot be used as they are. A "spot" or "patch" on each color should be on file in the color shop. Then as other colors are made up, possibly these dirty colors can be added to them in such small concentration as to have no effect. A great many of them can be used in experimental work.

Some of the cheaper all-rayon gamsas have a tendency to curl badly at the selvages during dyeing. Such fabrics will usually be streaky and poorly penetrated in the curled-up portion. Cloth of this nature should be dyed more slowly; addition of a penetrating and leveling assistant will help also.

When selvages curl

Protecting steam and water piping in dyehouses has always been a troublesome problem. One large mill uses an asphaltum-base black paint on pipes in the basement, with fairly good results. It has the advantage that it can be applied to surfaces that are moist and damp; of course, as with any paint, all loose rust or scale should first be removed, otherwise it will peel off in time and carry the paint with it.

If a printing-paste box is filled from the center every time, the sides will tend to get dirty. Likewise, if it is filled from one side all of the time, the other side tends to get dirty. This is particularly true with colors that have a small coverage. A box should be filled evenly across its length every time color is added.

One dyer devised a means of heating hosiery dyeing liquor indirectly by means of a closed steam pipe. The perforated pipe is enclosed by a larger

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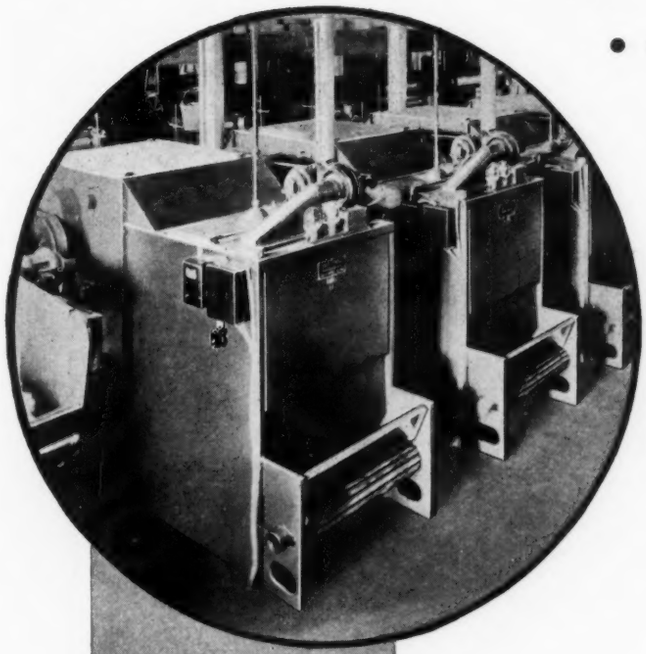

Throughout the modern textile mill, SKF Bearings are used—from foundation to roof, from wall to wall. Not only in cotton mills, but in silk, rayon and wool mills, there's hardly a type of machine to which SKF Bearings are not applied.

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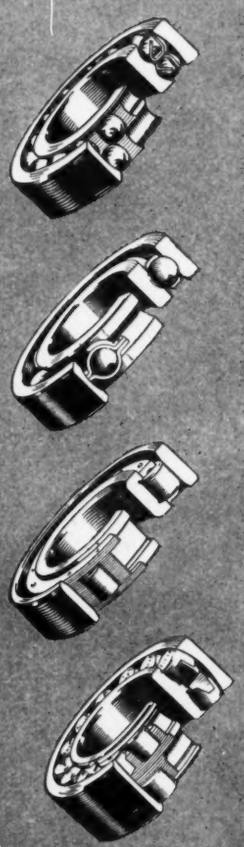

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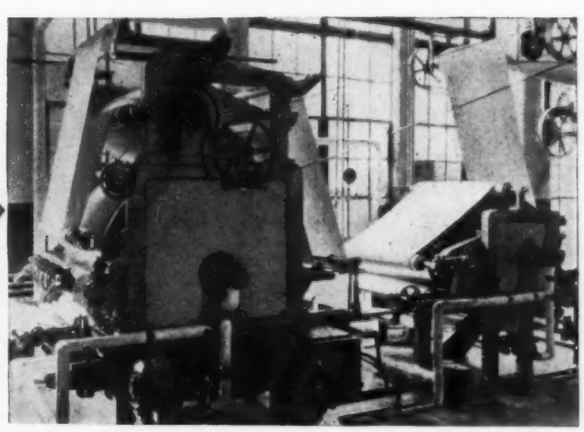

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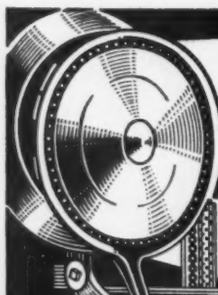

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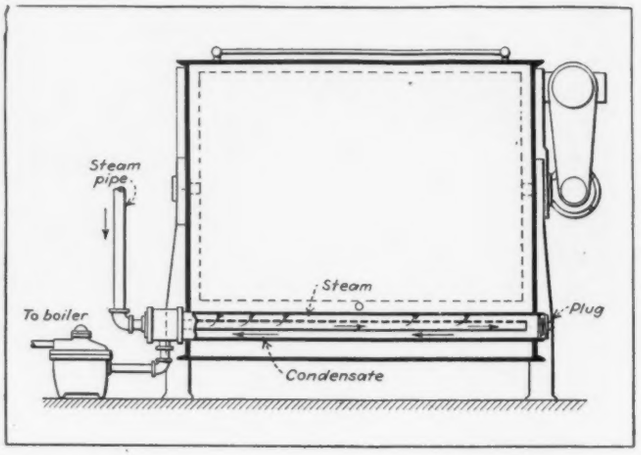


Method of heating hosiery dyeing liquor indirectly

pipe. This pipe extends through the kettle and is closed at one end by a plug. At the other end it is connected to a reducing tee through which the supply steam pipe enters. A small pipe leads to the steam-trap tee, which returns the condensate to the boiler. Steam cannot come into direct contact with the dye liquor; hence there can be no dilution or contamination. And, since the condensate is hot distilled water which is automatically returned to the boiler, it is quickly evaporated into steam again. (Diagram shown above)

Success in using direct dyes to dye viscose and leave acetate rayon untinted depends on getting a fairly good exhaust of the direct color and rinsing the fabric free from all traces of loose dye before drying. Otherwise, the heat of the dryer will cause some colors to bleed and tint the acetate. When the dyeing is finished, add a little acetic acid and epsom salts to the final rinse water; this will keep the color from bleeding.

Before rollers are put into a printing machine the pattern should be examined carefully by the colorist and the rolls marked in the order he wishes them run. In some cases it is impossible to arrange the order of rolls so that all the colors will stay clean. If this is true the rollers should be arranged so that only one color will get dirty.

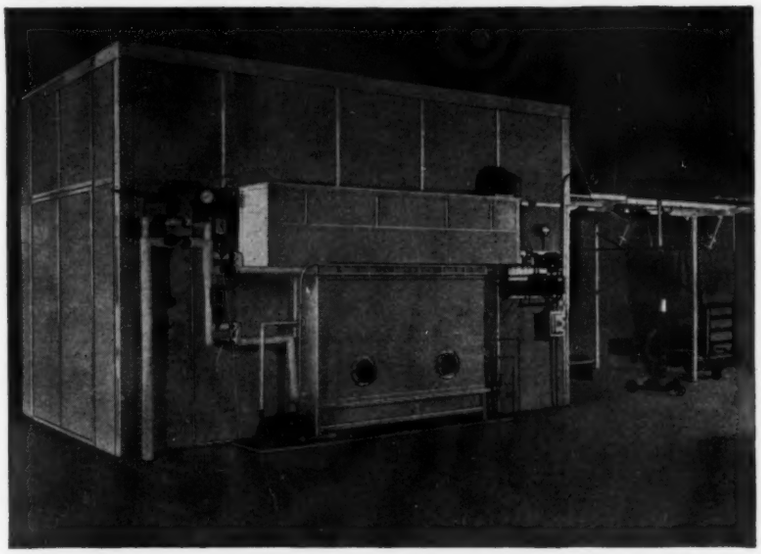
Kinks for Engineers and Mechanics

New belts when first used are rather stiff and dry and should be given a good dressing to lubricate the fibers and make them sufficiently pliable properly to conform to the shape of the pulley and maintain full pulling power. The best dressing for the purpose is made from 1 gal. neat's-foot oil and 1 lb. beeswax. While a belt is at room temperature on a loose pulley, apply hot dressing in a thin stream with a criss-cross motion, until it penetrates well into the leather. Clean off excess dressing before shifting the belt to the tight pulley.

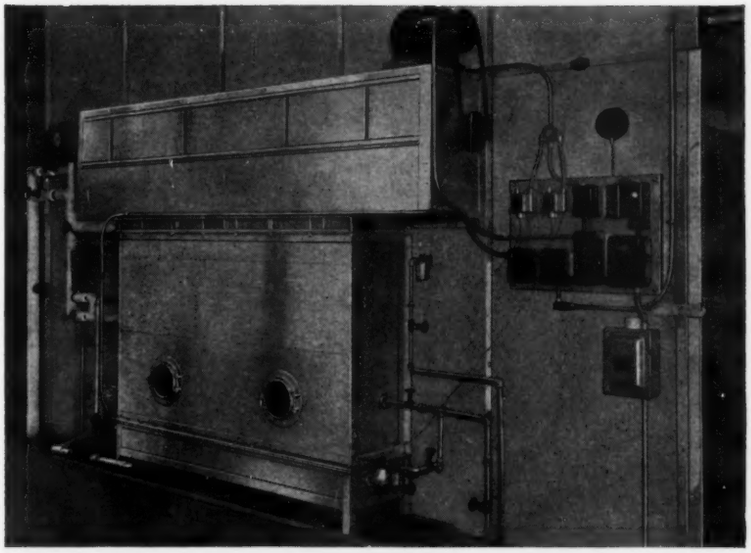
Before the inside of a steel tank is painted all mud, silt, and grime should be removed. The surface should be allowed plenty of time to dry. The drying time can be accelerated if forced circulation is set up by connecting an air compressor to the base of the riser and removing the roof hatch-cover. The same method can be used to speed up drying of the paint. This will also improve working conditions and minimize the hazard of paint poisoning.

To avoid the danger of using a pair of pliers in removing and replacing a blown-out fuse, make a fuse puller like that illustrated on page 124, which can be used with com-

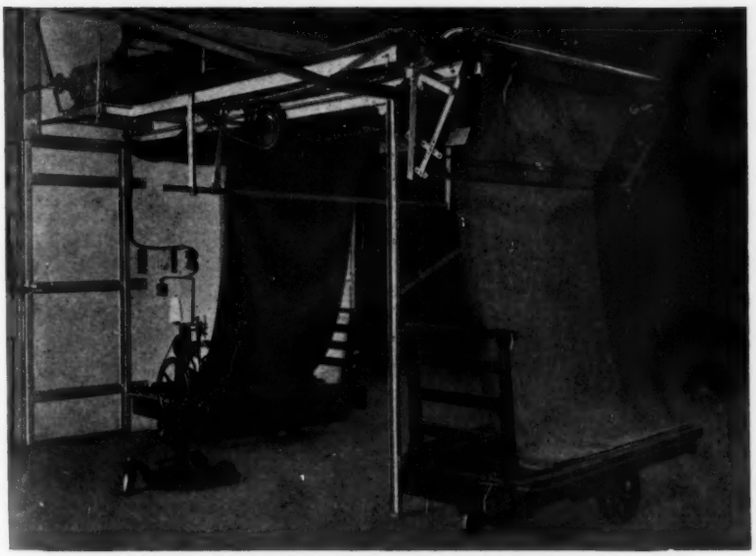
HOW TO RESTORE NATURAL



MOISTURE TO CLOTH AT



30 YARDS PER MINUTE



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Note: Hunter Brilsonair Conditioning and Drying Systems, are designed, manufactured and sold jointly by the James Hunter Machine Company of North Adams, Mass., and the Bridges-Wilson Corporation of Boston, Mass. For complete details on room, yarn or stock conditioning, write either company.

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WHITMAN Yarns

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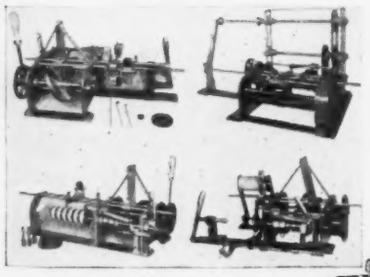

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SINGLE END
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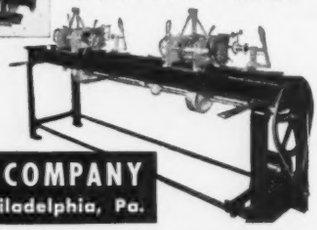
CAM TRAVERSE
SCREW TRAVERSE
MULTIPLE HEAD

We manufacture twenty styles of spooling machines for as many material combinations.



FIDELITY MACHINE COMPANY
3909-19 Frankford Ave., Philadelphia, Pa.

RALPH E. LOPER CO.
INDUSTRIAL ENGINEERS

Specializing in Textile Costs and Operating Methods for More Than a Quarter of a Century

COST SYSTEMS
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COST REDUCTION SURVEYS
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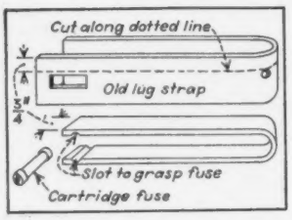
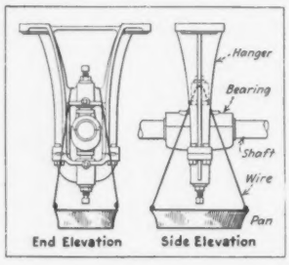
PRACTICAL HELPS...
. . . for OPERATING EXECUTIVES



A safe fuse puller

plete safety. It is constructed by taking a discarded lug strap and cutting off a ¾ in. strip. File a slot in each end of the strip. To remove a fuse with this puller, insert the tool into the switch box and press the slotted portions over the damaged fuse; to insert, reverse the procedure.

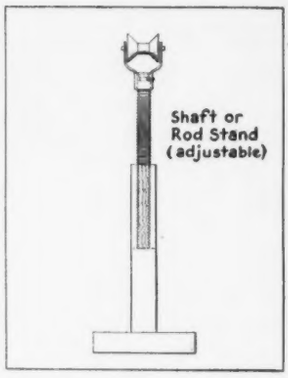
Small bread pans purchased at the hardware store and hung in the manner shown will elimi-



To catch oil drippings

nate trouble from oil which drips from hangers. The size of pans should be directly proportional to the size of hangers. If pans of the type described are not available, drip pans can be devised from empty 2-gal. oil cans secured from a nearby garage.

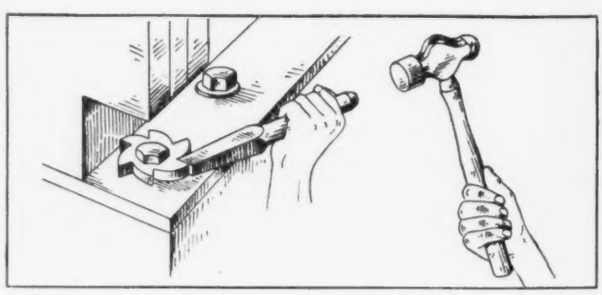
For removal of stubborn or frozen nuts, make up from plate steel disks a set of standard sizes of "star drift" wrenches. They can be used in places where it is difficult to get an ordinary wrench, either to tighten or to loosen nuts, by simply turning the disk over to suit the direction of the drift blow on the notch. Be sure to make the wrenches of a good grade of steel, and temper them so they will not be brittle or soft.



Adjustable shaft or rod stand

The support shown in the accompanying sketch is useful to aid machinists in changing the position of a shaft, rod, or casting when working them in milling or other machines. The swivel pulley is mounted on a column threaded similarly to an automobile jack. This support is designed to be adjustable to the height desired, thus placing the supported end of the material in such a position that accurate workmanship can be performed.

An empty 5-gal. oil container can be converted into a tool carrier. The can is cut carefully across the diagonal, and a little turned in and beaded over the edge to stiffen the carrier. Tabs are cut out in the locations desired, and the tools mounted by bending these tabs as shown. A handle for carrying is made of suitable round rod and inserted in



Star drift wrench for tightening or loosening nuts

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PERKINS
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is the natural result
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experience in the
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USE 3-IN-ONE OIL on heddle bars, heddles, reeds, harness and shuttle pins
3-IN-ONE OIL keeps looms in condition by meeting the different protective or lubricating needs of the many small but highly important parts in intricate textile mechanisms.
3-IN-ONE-OIL lubricates without gumming—it keeps bearings clean — it saves many dollars and hours of shutdowns and costly repairs. Write today for special mill prices.
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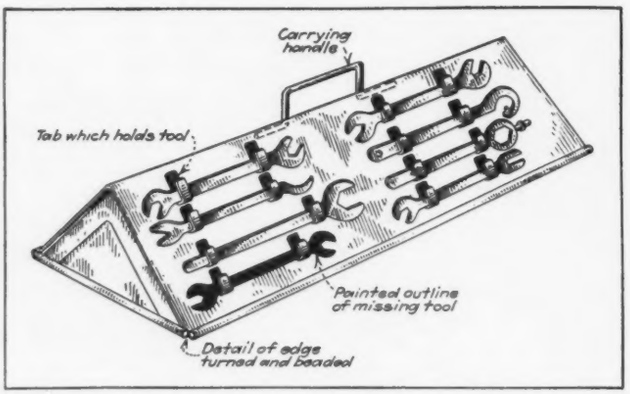
PRACTICAL HELPS...

. . . for OPERATING EXECUTIVES

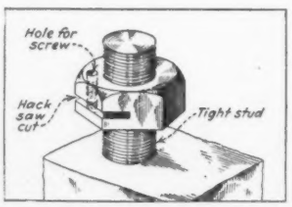


Oil can makes handy tool carrier

holes in the apex, after which the under part is bent right and left to distribute the support. An outline of each tool painted on the face of the carrier indicates plainly when any tool is missing.

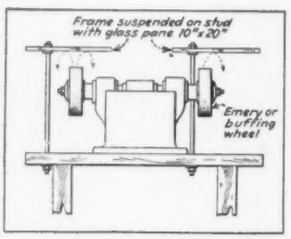
Looms should be tested from time to time as to levelness. This is especially important where wide looms are in use. It is also necessary that all group-drive motors be thoroughly inspected and a report made once a week. All main-drive pulleys and belting should be examined weekly, and reports made as to the condition of the bolts or other fastenings. Belts should be given the attention they need in the way of dressing.

A simple method of removing tight studs is illustrated in the accompanying sketch. A hacksaw cut is made half way through a nut, following which a hole is drilled and tapped to be fitted with a screw. The nut is screwed on the tight stud, and the screw through the nut is then tightened. This pulls the two parts of the nut together in such a manner as to bind it on the stud. Then it is a simple matter to remove the stud by applying the wrench to the nut.



For removing tight studs

Some persons, and rightly so, object to using goggles for grinding or buffing which have been used by other persons. However, it is possible to rig up, with little trouble, a device which will protect the man in the shop from flying particles. This is a frame fitted with a heavy piece of transparent glass, suspended by a steel rod fastened through the base of the emery, grinding,



Safety device protects eyes

or buffing arbor, stand or table, and so arranged that it can be swung over the face of the wheel while it is in use.

Scale formations in the spray nozzles of air conditioners, consisting primarily of lime, can be partially controlled by frequently draining the spray pan and re-filling with fresh water. When the nozzles do become fouled, they can be removed from the conditioner and soaked in a commercial hydrochloric acid solution made up of one part acid and one part water. When all scale is dissolved, nozzles should be immediately taken out of the acid and washed thoroughly with water to minimize action of the solution on the metal.

THIS MAN SAVED ME $1,200.00 LAST YEAR!

1. "CONDITIONS WEREN'T SO HOT—business was poor, costs were high . . . and the results in my scouring and bleaching were turning out only fair. Frankly, I was pretty much discouraged!

2. "ONE DAY THE C.P.P. MAN CALLED—I explained my difficulties—asked if he could help me. He said he'd have his technicians check my processing formula . . . and offer suggestions for improvement.

3. "HE RETURNED A SHORT TIME LATER—with a new formula. He said it would solve my problems. We tested it . . . found it was perfect! Our goods bleached out *far* better—*and costs were down 43%!*"

NOW...THANKS TO C.P.P. SOAPS AND SERVICE—I'M SAVING $1,200.00 A YEAR...AND GETTING BETTER PRICES FOR MY FINISHED GOODS, TOO!

THIS is an actual case history taken from our files. It's but one of many where we have helped textile manufacturers cut soap costs . . . get better results.

No matter what your processing requirements may be, in the complete line of C.P.P. Products you'll find detergents and wetting agents to exactly fit your needs.

C.P.P. processing agents in most cases *cost less* to use than so-called "special" products because of the volume in which they are produced. Ask your C.P.P. man for full information, or write to us. Either way, there's no obligation.

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INDUSTRIAL DEPT., JERSEY CITY, N. J.

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Bringing Down the Pheasant with the Help of Soda Ash

Sounds far fetched; but wait! It takes the finest steel to make guns that shoot straight and blades that stay sharp. Soda ash is used in the manufacture of quality steel. By reducing the sulphur content and by exercising certain other refining properties, sodium carbonate (soda ash) makes cast iron purer and closer grained. Hence steel made from iron thus treated is finer and possesses greater ductility.

COLUMBIA supplies the steel industry with Hennig Purifier; small briquettes of specially compounded soda ash which perform their humble but important part in foundry, blast furnace, open hearth and Bessemer mills to give the world cleaner, purer steel and iron.

And in the other fields of endeavor in which COLUMBIA Soda Ash plays its part, purity is ever and eternally the watchword. So, too, with COLUMBIA Caustic Soda, Liquid Chlorine, Sodium Bicarbonate, Calcium Chloride and Modified Sodas — whether the shipment be large or small, the quality is always high and uniform. In fact, purity of product, cleanliness of containers, and the convenience of customers are the open secret of COLUMBIA's ever-widening distribution.

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Throughout the world

KOHORN has specialized

in Rayon and Staple Fiber Production Problems

VISCOSE • ACETATE • CUPRAMMONIUM

Individual Machines and Complete Rayon and Staple Fiber Plants.

More than 20 years experience and a staff of first-class chemists and engineers enable us to develop and perfect the most efficient processes and machines.

CONSULT US
BEFORE TAKING ANY STEPS

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501 FIFTH AVE., NEW YORK CITY

The Joseph Noone's Sons Company

A. Erland Goyette, Proprietor

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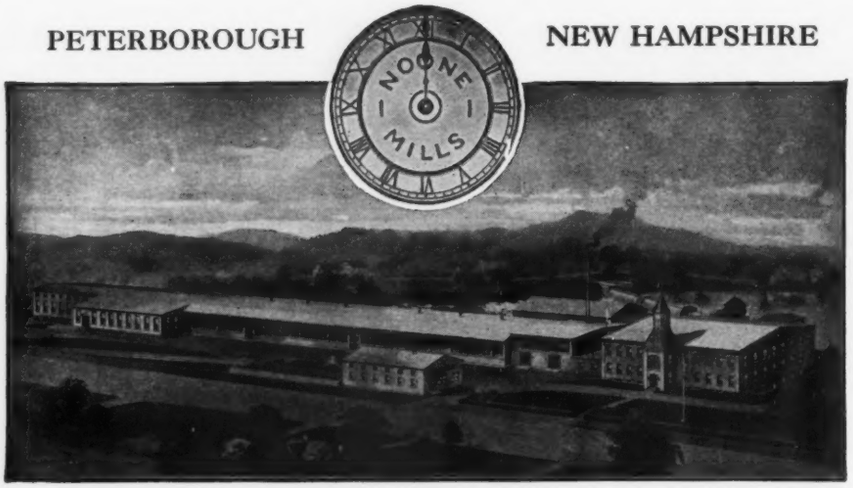

Established 1831

Noone's Standard Roller Cloths

Insist on Noone's Standard Roller Cloths for your Spinning Rolls. Noone's have been Standard since 1831.

Results and costs are what count most.

Use Noone's Roller Cloth and be assured of a Strong Round uniform yarn, the best obtainable. Eventual cost, less than any other covering.

Good spinning can always be obtained when Noone's Roller Cloth is used, as it is the properly built Cloth,—has the correct cushion and consistency, and uniform gauge.

Noone's is best by test.

Many materials have been used for Spinning Roll Covering in years past, but have eventually been discarded in favor of the dependable Woolen Roller Cloth and Leather.

Do not be misled, put your faith in the good Old American Products: Noone's Roller Cloth and leather. If in doubt, allow us to demonstrate the superiority of our Roller Cloth and a leather cot.

Use Noone's Roller Cloths, Noone's Slasher Cloths, Noone's Clearer Cloths.

Noone's are the Pioneers in Mechanical Cloth Manufacturing in America.

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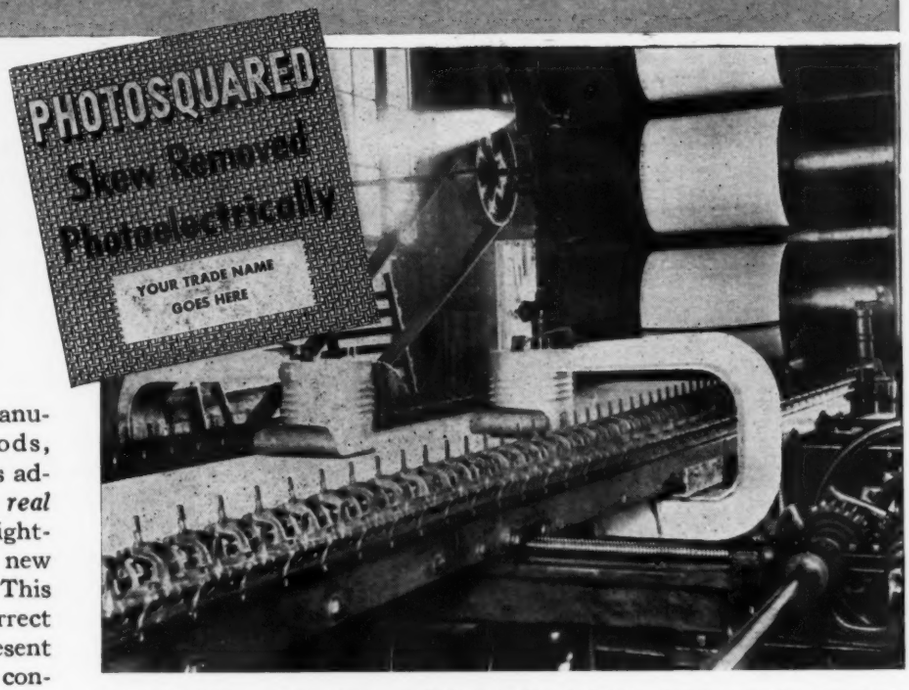
How PHOTOSQUARED CLOTH HELPS SELL

Advantages of Photoelectric Weft Straightening Apply Both to Finishers and to Manufacturers of Finished Cloth Goods



Use of this design as shown above is available to finishers for labeling cloth processed by photoelectric weft-straightening control

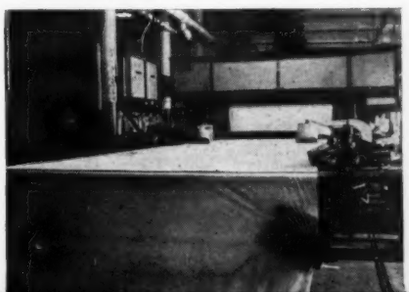
TO both fabric finishers and manufacturers of finished goods, PHOTOSQUARED cloth* presents advantages of high-quality that are *real sales* points. Photoelectric weft straightening can be applied either to new tenters or to tenters now installed. This system will instantly detect and correct skew at speeds up to the highest present tenter operating rate. It will operate continually with the tentering process, because, once the control is adjusted to a particular fabric, detection and correction or any skew are automatic. This system has been successfully applied to sheeting and birdseye.

To the cloth finisher, PHOTOSQUARED cloth provides the following advantages:

1. Less spoilage, because of absence of skew.
2. Faster production, less stopping for inspection.
3. Better finishing guarantees made possible.

To their customers, finishers can point out that PHOTOSQUARED cloth:

1. Is straight cloth—cloth that can be cut square with less waste.
2. Requires less allowance for trimming.
3. Will hold its shape, handle more easily.



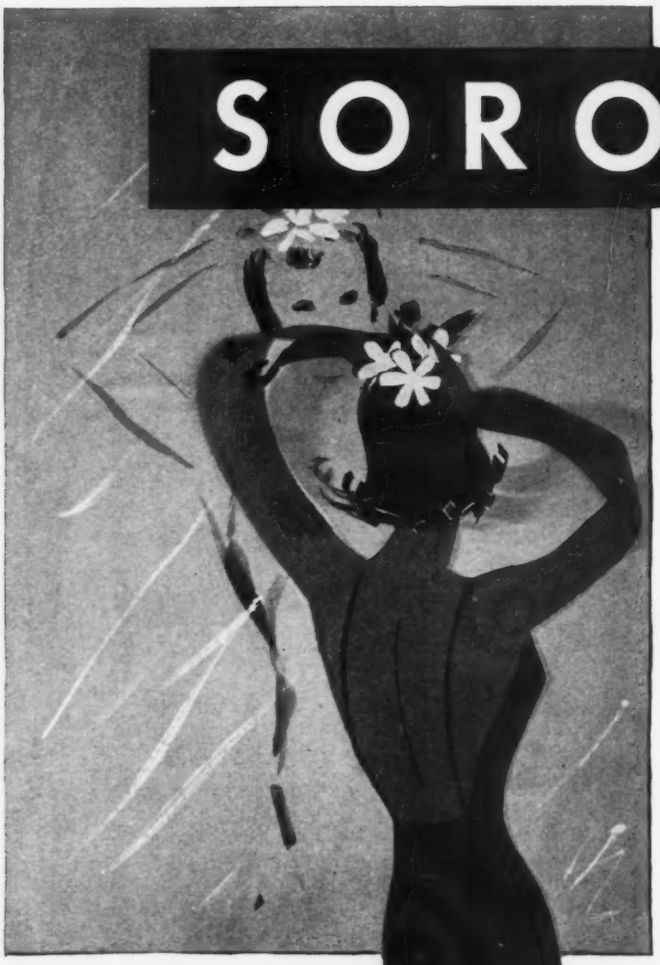
Already a half-dozen mills are using this advanced method of assuring straight cloth. For information regarding its application in your mill, send data on the speed range of your tenters, samples of cloth, rating of tenter, motor drive, and mill voltage. Address your inquiry to Winsor & Jerauld, Providence, R. I., or to General Electric, Schenectady, N. Y.

*PHOTOSQUARED IS THE TERM DEVISED TO DESCRIBE CLOTH FINISHED BY USE OF PHOTOELECTRIC WEFT-STRAIGHTENING CONTROL. General Electric developed this control, and the COMPLETE straightening equipment is sold by Winsor & Jerauld, Providence, R. I.

GENERAL ELECTRIC

011-475

SOROMINES



are the ideal softeners for giving rayon fabrics the smooth, subtle drape that appeals to discriminating customers.

GDC

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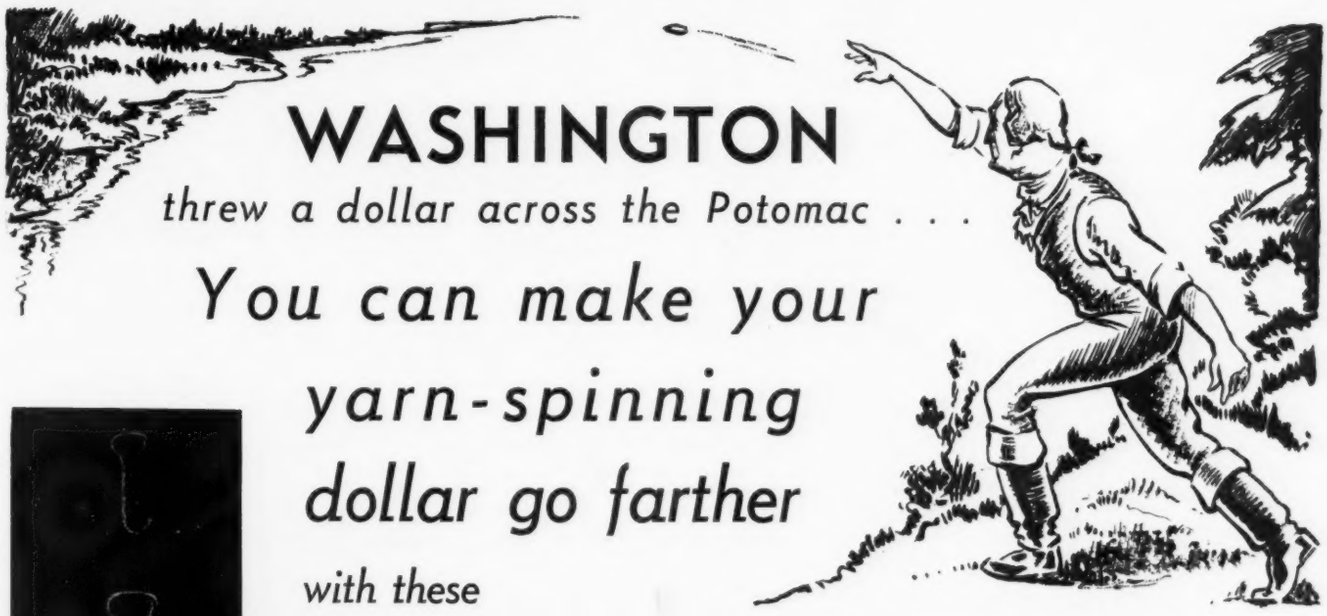

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threw a dollar across the Potomac . . .

You can make your yarn-spinning dollar go farther

with these

U. S. TRAVELERS

Sold under the trade names

Bowen Round Point Travelers

Bowen Square Point Travelers

Bowen Improved Vertical Bronze

Bowen Patented Bevel Edge

Bowen Patented Ne-Bow Vertical

Bowen Patented Vertical Offset

Bowen Flat Oval and Round Wire Travelers

Left—NE-BOW *Patented*

VERTICAL RING TRAVELER

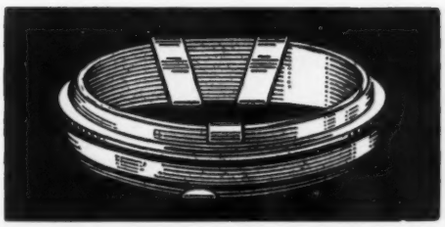
Developed to meet the particular needs of the silk and rayon trade in the process of throwing, due to the recent adoption of the vertical ring, particularly of the lubricating type.

By eliminating the pivoting action of the traveler, the traveler is at all times kept in close contact with the groove or device for lubricating the ring and assists in drawing therefrom the lubricant, distributing the same evenly over the entire inner surface of the ring; promoting a longer life to the traveler and a more even twist.

Left—BOWEN *Patented*

BEVEL EDGE

The Bowen Patented Bevel Edge feature of U. S. Ring Travelers produces ideally smooth even yarn. There are no angular edges to flatten the end. There are no split ends in throwing rayon and silks—no fly waste in the spinning and twisting of cotton wool, worsted, asbestos, kindred fibres. Made and stocked in all sizes and weights, for all kinds and counts of yarns.



Above—BOWEN *Patented*

VERTICAL OFFSET TRAVELER

After exhaustive tests under actual running conditions, the Bowen Patented Vertical Offset Traveler has proved its worth in the twisting of cords and plys. Based on the true mechanical principle of taking a diagonal position with relation to the ring, presenting a bearing surface over the full width of the Traveler. This design prevents gripping or binding—gives an even tension—an evener rounded product—longer life to the traveler. Send for sample and prices.

This sealed Metal Shipping Container protects you. On a par with the high quality of U. S. products is the care we take to see that they reach you in perfect condition.

U. S. RING TRAVELER CO.

PROVIDENCE RHODE ISLAND

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A Traveler for Every Fibre

"Yes, dear, I know it's my fault. I should have kept to the right back there when you said, 'turn left'."

You'll never get off the right road if you trust your own judgment and stick to

NIAGARA CARBONATE OF POTASH

The right road leads to Niagara Caustic Potash and Caustic Soda, too.

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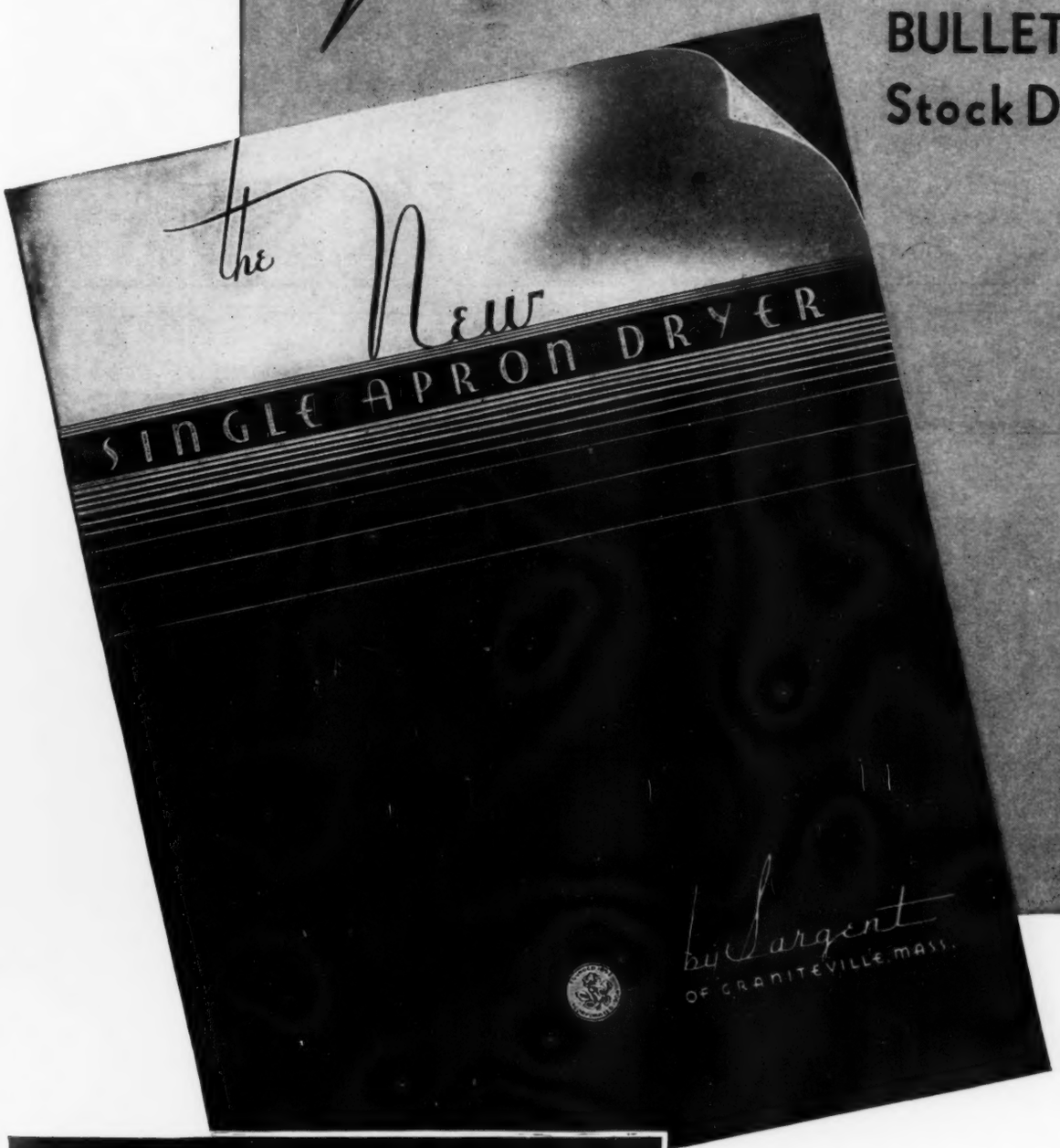
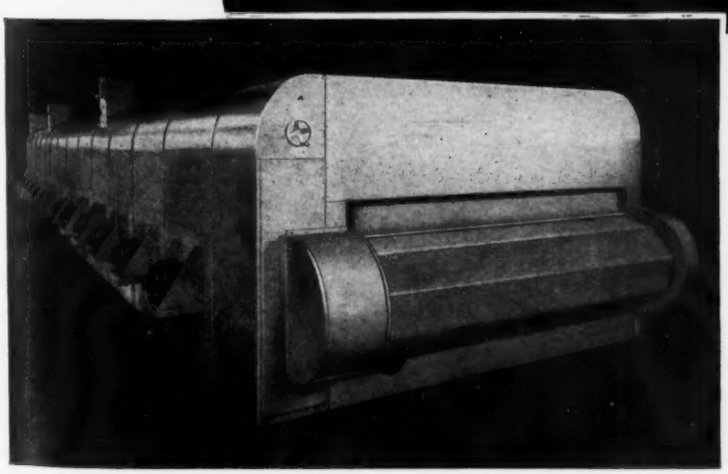
You Should Have This

BULLETIN on Stock Dryers





An up-to-the-minute Dryer designed to give the largest capacities in a minimum floor space, and showing decided savings in horsepower and steam consumption. Available in both single and double fan types.

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GRANITEVILLE, MASSACHUSETTS

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For Loading and Unloading

Trucks in these busy zones can load or unload quickly and easily with P&H Trav-Lifts operated by pendant rope or push button control. These cranes, designed for intermittent duty, are low in cost—available in any size and capacity up to 15 tons—provide the same movement of loads as continuous duty cranes. P&H Trav-Lift Cranes are described in Bulletin H-13. May we send your copy? Harnischfeger Corporation, 4566 W. National Ave., Milwaukee, Wis.

This new Bulletin completely describes P&H Trav-Lift Cranes and their applications. Ask for Bulletin H-13.

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HOISTS • WELDING ELECTRODES • MOTORS P&H EXCAVATORS • ELECTRIC CRANES • ARC WELDERS

THE call to-day is for HIGH SPEED in jack spooling and warping, together with UNIFORMITY of TENSION in both fields.

Our 43 years experience in building this class of machinery has proved that tight and slack ends in the warp have caused more trouble and expense than any other factor.

We are Originators and Developers of these machines:—

Wool and Worsted

- WARP COMPRESSORS for wool warps
- WARP COMPRESSORS for slashers
- WOOL BEAMERS
- DUPLEX BEAMERS
- DRY DRESSING FRAMES
- JACK SPOOL CREELS
- COMPRESSING SPOOLERS, standard
- COMPRESSING SPOOLERS, Hi-speed
- MULTIPLE SPOOLERS
- MAGAZINE CREELS Hi-speed for spinning frame bobbins and cones
- BEAMING HEAD and COMPRESSOR for papermakers felts

Carpet

- BEAMING HEAD and COMPRESSOR for sizing machines
- WARPER CREELS for sizing machines
- BEAMING HEAD and COMPRESSOR for wool warps
- DIRECT BEAMING OUTFIT for Axminster and unsized warps
- WARPER CREELS for weaving-direct for Wilton looms

Rayon and Cotton

- MAGAZINE WARPER CREELS for cones, tubes and spools
- SINGLE END WARPER CREELS for cones, tubes and spools
- WARPER CREELS for twister spools and packages

HIGHER SPEED
UNIFORMITY OF TENSION
BETTER WARPING
DECREASED COSTS

WARP COMPRESSING MACHINE COMPANY
WORCESTER, MASS.

JUST TRY ONE OF OUR ROLLS...

New or Refilled

...Then you'll know why they are called Long Life Rolls. You'll also know why they are used in the largest textile plants in the world.

During more than half a century of roll making, we have developed a process for making calender rolls which makes us ask *you* to try just *one* Long Life Roll. Put it in the stack with any other roll and time them both. We want you to be sure that you get more for your money in a Long Life Roll.

★

We make calender rolls of cotton, cotton and husk, wool, wool and cotton, husk and paper (all kinds) in any width and diameter, standard to the trade. Heads and shafts and keys are forged steel. "They never come loose on the shaft."
★

H. W. BUTTERWORTH & SONS CO., PHILADELPHIA, PA.

Established 1820

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TURK'S HEAD BUILDING
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YOU can get practically any bearing you want for any application, in any quantity, instantly from stock by mere easy reference to Bunting's Catalog. Ask your mill supply wholesaler.

For made-to-blue-print products and unusual or special requirements, we offer the most advanced and complete service in the industry. Ask about it... The Bunting Brass & Bronze Company, Toledo, Ohio. Warehouses in All Principal Cities.

A BOOK THAT IS AS BIG AS A *Warehouse*

BUNTING Quality

BRONZE BUSHINGS • BEARINGS
PRECISION BRONZE BARS
BABBITT METALS

"Perfection in spinning can be most nearly obtained by using"

"THE DARY TRAVELER"

The Dary Ring Traveler Company has been in business for more than 38 years and has been constantly improving the methods of manufacturing High Speed Travelers, until today we are able to produce Travelers of a guaranteed weight, temper and style. Dary Travelers are made from a specially drawn stock by skilled workmen with years of experience. It is the Dary Process with diligent watch over every detail and the co-operation of our customers that has enabled us to manufacture a Traveler that is unequalled

The Dary Ring Traveler Company, Taunton, Mass.

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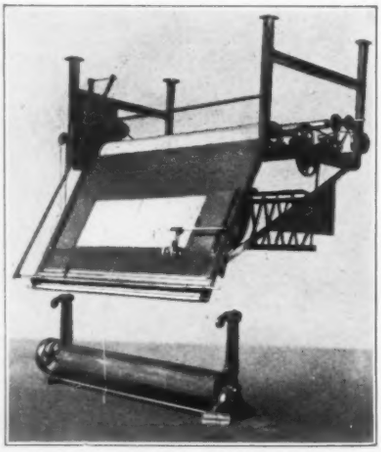

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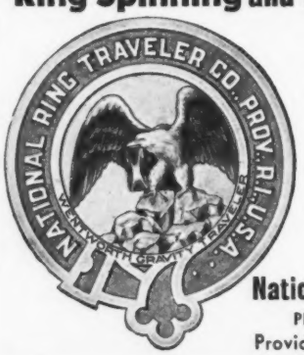

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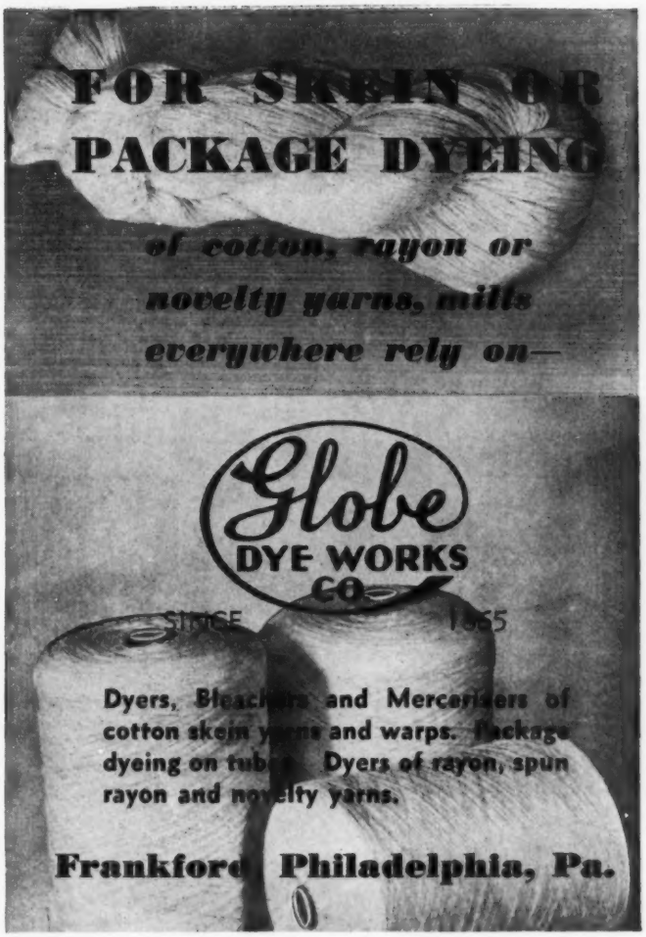
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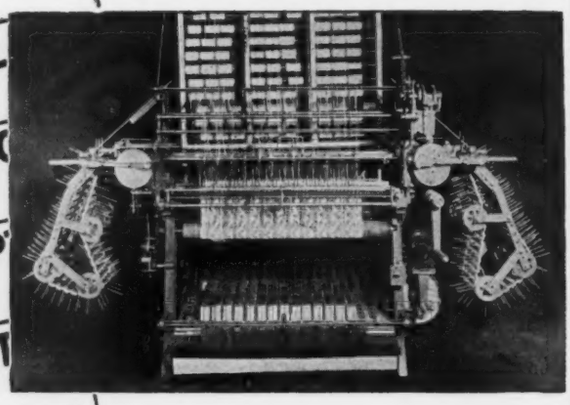

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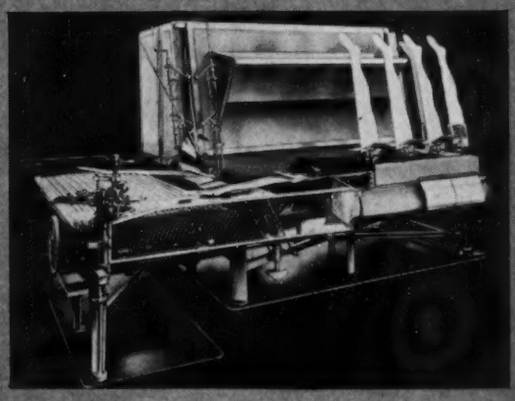

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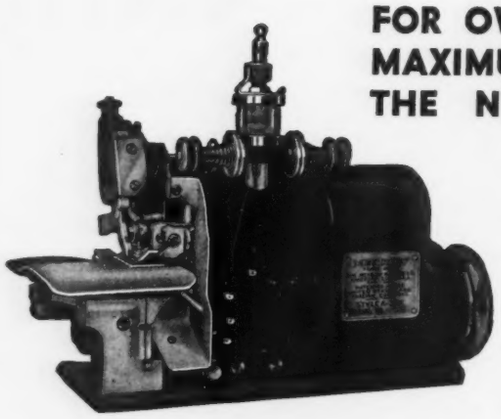
Established 1838 **MERROW** **Incorporated 1894**



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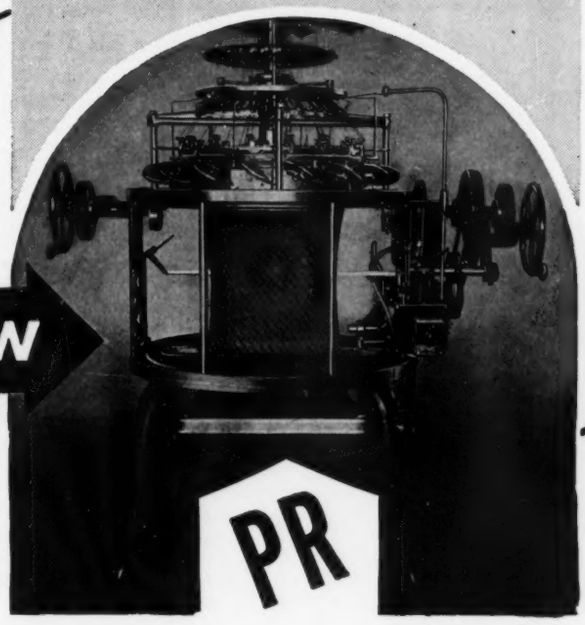

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Where great elasticity is desired (as in bathing suits) and where welt stitch figures are wanted—it is particularly valuable.

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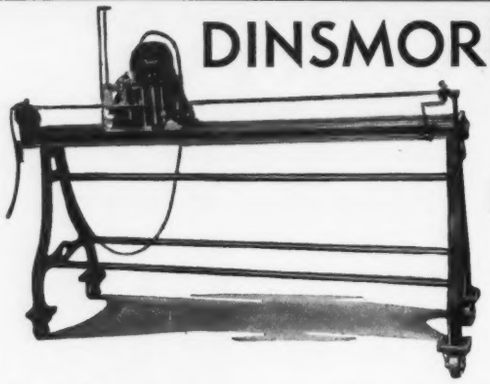

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Behind every modern detail of Crane Equipment lie 50 years of specialization in the field of Knitting Machinery. Crane superiority is the result of close cooperation with actual knitters, a close study of real problems in actual mills, and an ability to produce exactly the machines to meet all demands.

CRANE features are the result of long experience with knitters and their problems

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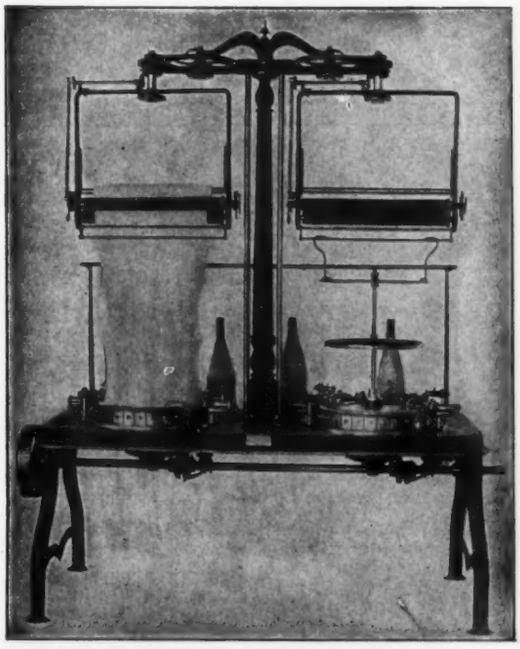

Our Spring Needle Underwear Machine with Automatic Take-up is shown here. This machine is made in sizes from 10 in. to 36 in. in diameter for the production of a great variety of fabrics of any desired gauge, the number of feeds depending on the size of the cylinders. Aside from the feeds for plain fabrics the stockinet, eiderdown and astrachan feeds are superior to any on the market.

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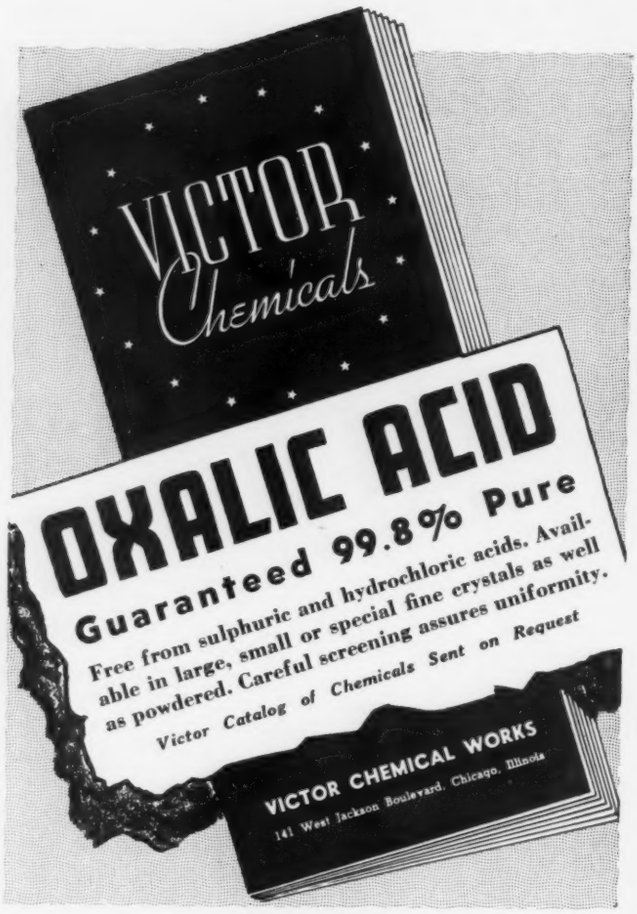
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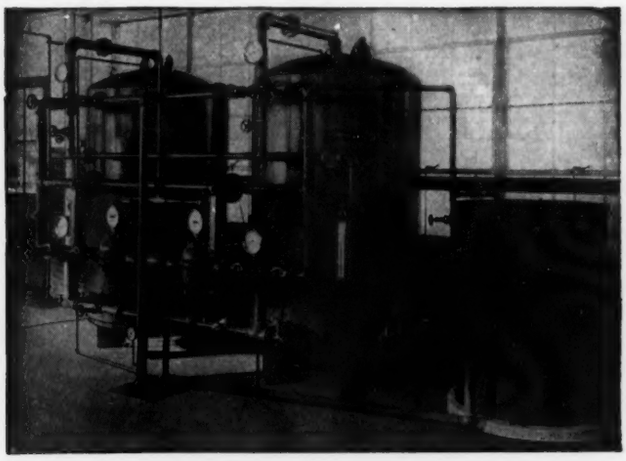

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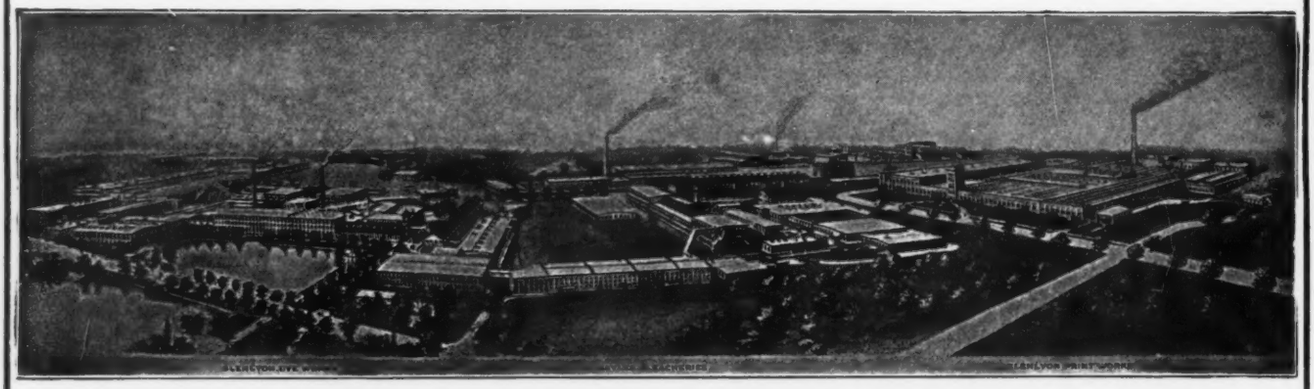

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TEXTILE WORLD ANNUAL

FEBRUARY, 1939

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MILL SUPPLIES MILL PROPERTIES
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Modernize Your Plant

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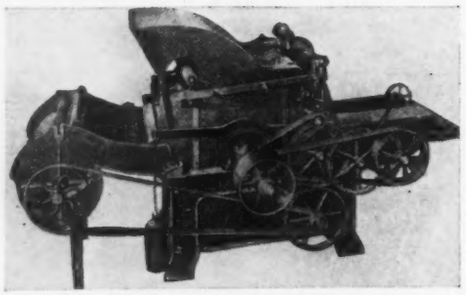
RAG PICKERS

NEW or REBUILT



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67 Payne Street **Lowell, Mass.**

R. W. McKITTRICK, *Manager*

Rebuilt Rag Pickers, Bagging Machines etc. frequently available

PICKERS—Send for List of Feeds

2—D&F 48" Mixing Pickers
1—D&F 48" Fearnaught Picker
1—C. S. Dodge Rag Picker
2—C. G. Sargent 48" Multiplex Burr Picker
1—C. G. Sargent 36" Duplex Burr Picker
1—C.&M. Parkhurst 48" Burr Picker
1—Atlas Parkhurst 48" Burr Picker
1—D&F 36" Mixing Picker
1—D&F 24" Mixing Picker
1—Kitson English Rag Picker
1—Gerry 48" Lumper

CARDING—WOOL

5—D&F 3 Cyl. 48" face x 60" dia. Bramwell Feed. Garnet Breast, Rubb Condenser. All iron construction. Clothed.
2—D&F 3 cyl. 48" face x 60" dia. as above—Rebuilt.
2—Lombard 3 cyl. 48" face 60" dia. Bramwell Feed. D&F #25 Garnet Breast. Whitin Broad Band Feed (1929). Cashiko Tape Condenser, 96 ends. Wood Cyls. Will sell tapes separate.
1—D&F 3 cyl. 60" face x 48" dia. Bramwell Feed. #17 Garnet Breast Apperly. Rubb Condenser. Clothed. Wood cyl.
2—D&F Double Finishers 48" face x 60" diameter with Rubb Condensers. All iron. Clothed.
1—D&F Single Breaker 60x60 with Bramwell feed, Garnet Breast. All iron.
2—D&F Single Breakers 60" face x 48" dia. with Bramwell feed. Garnet Breast. All iron. Clothed.
2—Bramwell Card Feeds 60".
3—Bramwell Card Feeds 48"—Rebuilt
3—D&F #17 Garnet Breasts for 48" Cards
2—R-H 60" Floor Grinders
1—B. S. Roy 60" Floor Grinders
1—B. S. Roy 48" Floor Grinders

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Visit our Warehouses in Lowell, Mass.—over 100,000 sq. ft. of floor space filled with all types of Textile Machinery.

300—Card Spools Fibre Head 59½"x8
1—D&F 60" Tape Condenser 2 Bank for 48 ends.

MULES—WOOL

2—J&B 280 spdl. x 2¾" ga. Hi-Speed Heavy Duty 9½" Bobbin. Send samples of bobbins wanted.

LOOMS—LOOM BEAMS—Etc.

4—C&K 92" Hvy. Type. 25 Harness. 4x4 Box Belt Drive. Pick clocks. RI Elec. Warp Stop Motions
10—RT 4 Bank Elec. Warp Stop Motions 92".
10—C&K 82" Hvy. Type 30 Harness. 4x4 Box Belt Drive.
150—Loom Beams 82"x6⅝" bbl. for C&K Looms.
158—Loom Beams 92"x6⅝" bbl. for C&K Looms.
3000—Bars C&K Box Chain
4000—Bars C&K Harness Chain 20, 25, 26, and 30.
278—Harness Frames 87½"x14" Heddles
113—Harness Frames 75"x14" Heddles
204—Harness Frames 70"x14" Iron End.
125—Veeder Root Day and Night Pick Counters.

FINISHING

1—P&W 66½" Dble Shear Model "A".
1—C&M 66"x2 Cyl. Dble. Acting Brushing Mach. with Steam Box.
1—Windle #4 Doubling-Winding-Measuring Mach. for 60" Cloth.
1—P&W 65" A.W.C. type measuring mach.
1—P&W 80"x20 Roll S.A. napper, #5575.
1—Gessner 66"x15 Cyl. Hi-Production Bble. Bed Rotary Press.
3—Inspection Perches 72" with 60 yd. Clocks.
1—Inspection Perches 80" with 100 yd. Clock.
2—Tillotson Hand Perches 72" Adjustable.
1—Walsh & Houston; and Houston Rotary Sewing Machines.
1—Wilcox & Gibbs Sewing Mchs. for overedging blankets — Rebuilt.
1—Metropolitan Style 26AT1 for overedging—Rebuilt.
1—each; Merrow Sewing Mchs. Style 601 and 60UD.
1—Singer Numbering Machine Head.

EXTRACTORS

1—King & Gerber 60" Motor Driven.
1—Broadbent 60" Copper basket. Underneath Belt Drive.
1—Tolhurst 40" Lead Lined. Overhead Belt Drive.

FOSTER WINDERS—DOUBLERS

3—Foster Model 101 Cone Winders 80 Spdl. x 6" tr.
1—Foster Model 25 Doublers 100 spdl. x 6" tr.
1—Foster Model 25 Doubler 50 spdl.
1—Foster Model 30 Cone Winder 100 spdl. Waxing attachment.
6—Foster Model 12 Cone Winders 100 spdl.
172—Foster Thread Waxing Attachments.
200—Foster Wood Tube Yokes Model 12.
400m New Paper Cones Foster Nu-taper.
5m Wood Tubes 6⅞x1 1/16.

UNIVERSAL WINDERS

5—Uni #90x20 spdlsx8" bobbin. Bunch Bldrs. Serial #41,900.
2—Uni #50 6 spdls x 11" p. tube Winders.
22—Franklin Spring Spdls. for #50 Winders.

JACKSPOOLERS—SPOOLS

3—D&F 40" Compression Spoolers 1926.
2—Wor. Warp. 6 drum Multiple Spoolers 32¾" 40 ends.
2—Sets 6 Drums each for above 48 ends.
1—D&F Sgl. 50" Jackspooler — Like new. 48 ends.
1—D&F Sgl. 41" Jackspooler 40 and 48 ends.
2—D&F Sgl. 33⅛" Jackspooler 40 and 48 ends.
1—each Multiple Spooler Creel 240, 252, 288, 306 ends.
Jackspools—Send size wanted.

DRESSING

2—D&F 92" Hvy. Type Brass Plate with Beamer. 1928-29.
1—D&F 110" Reel with Brass Plate.
1—Wor. Warp. Dry Dresser.

WORSTED—PREPARATORY

1—Hetherington 50" dia. x 54" Dble. Cyl. Card. 4 Lickerin type—clothed.
1—T&W Noble Comb 65" Rack.
12—Sets Comb circles.
1—PS. Dble Head Can Gill 5/16" P.
1—Sample H&S Sgl. Can Gill. (8" fallers.)
11—H&S Sgl. Baller Gills 7/16" P. (1922-4).
2—P.S. Sgl. Baller Gills 9/16" P. (1923.)

GILLING

55—Gill Boxes in stock for Drwg.
Send for Lists of Kinds wanted.

DRAWING—WORSTED

1—P.S. 12 spdl. x 9¼"p.—12x6.
1—S-L 10 spdl. x 9¼"p.—10x6.
1—H&S 12 spdl. x 9¼"p.—10x6.
2—S-L 8 spdl. x 9¼"p.—11x6.
8—P.S. 12 spdl. x 8"p.—10x5.
1—H&S 4 spdl. x 12½"p.—14x9.
2—P.S. 4 spdl. x 12⅜"p.—14x9.
3—P.S. 8 spdl. x 10¼"—12x7.
Send List of Mchs. wanted.

ROVING—WSTD.—REDUCING

12—S-L 36 x 5½" p. 6x3½ Spool Rabbeth Spdls. 1915-1921.
12—LMS 36 x 5½" p. 6x3½ Spool Rabbeth Spdls.
4—H&S 32 x 5½" p. 6x3½ Spool.
2—P.S. 18 x 7¼" p. 9x5 Flyer Reducers.
3—P.S. 16 x 7¼" p. 9x5 Flyer Reducer.
1—H&S 16 x 7¼" p. 9x5 Flyer Reducer.
1—H&S 24 x 7¼" p. 9x5 Flyer Reducer.
1—S-L 12 x 7¼" p. 9x5 RING Reducer.
4—H.S. 24x6" p. 4x8 Ring Rovers Spools—Parts—etc.

SPINNING—WORSTED

10—H&S. 180 x 3¾"p. x 5 ft. Frames.
6—H&S. 200 x 3½" p. x 5 ft. Frames 1919.
6—S-L 200 x 3½"p. x 5 ft. Frames 1917.
4—H&S. 144 x 3½ p. x 5 ft. Frames. Used very little.
5—S-L Hvy. Dbule. Bldrs. for 5 ft. frame.
1—Sample frame 32 x 3½"p x 5 ft.
Caps—Tubes—spdls.—top front rolls—parts—bobbins, etc.
60—P.S. & L.M.S. 168 x 3½"p. Cap Frames—Will sell parts from some of these frames.

TWISTING—WORSTED

5—S-L #1 Ring Changeovers for 160 spdl. x 3½"p. frames—NEVER USED.
10—S-L 200 spdl. x 3½"p. x 5 ft. Cap Trap. 1918-20.
3—H&S 192 x 3½"p. x 5 ft. Cap Trap.
9—H&S 168 x 4"p. x 5 ft. Cap Trap (will change to 3" Ring.)
1—PS 160 x 3½"p. x 5 ft. x 2½" Ring Dolly Roll type.
Caps, tubes, spdls, parts, bobbins, etc.
13—P.S. 152 spdl. x 4" Ring 1928 Universal — dolly roll type. Abt 10 oz. bobbin.

FIBRE CANS—TRUCKS

52—NEW 14x24 Fibre Seamless.
202—Seamed 10x36.
142—Seamless 6x32½.
857—Seamless 7x32½.
15—Square Dble. 12x18x36 Cans.
26—Metal Clad Fibre Trucks 38x19½ Wx 29D.
4—M&C Fibre 54 x 32 Wx 28D.

MISCELLANEOUS

1—Set Dry Cans 19 copper & 1 steel 23x84".
1—Deane 4x4 Triplex Pump.
1—Spencer Oiler 48".
1—D&F 80x1⅞ Jack Winder.
1—D&F 48 spdl. Jackwinder—Like new.
900m Loom bobbins in stock—send samples of style wanted.
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Motors—Scales—Belting, etc.

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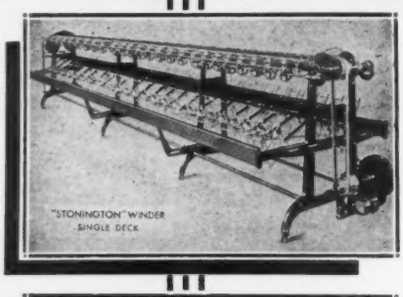

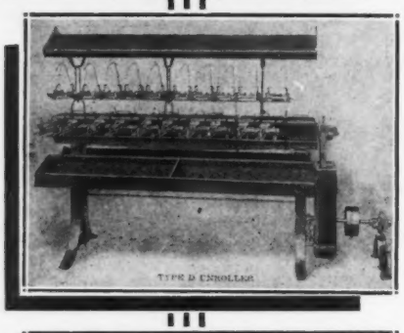

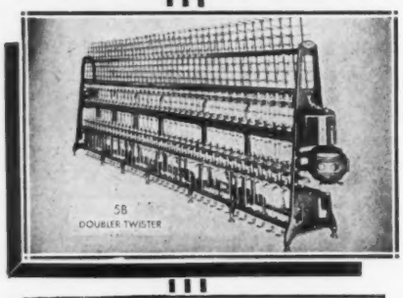

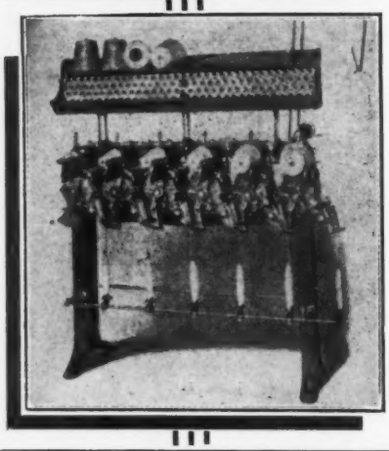

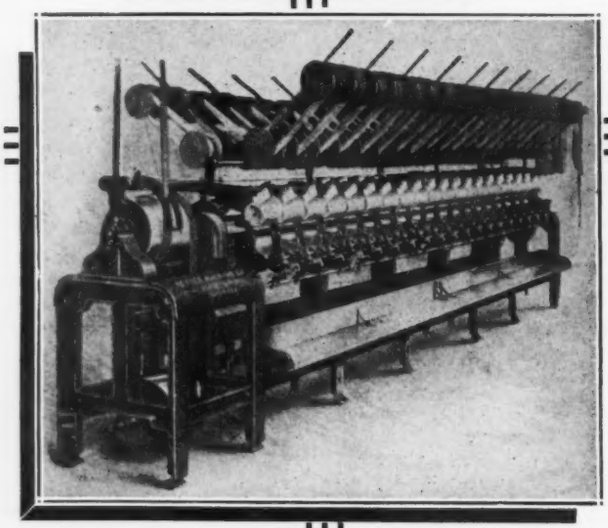

WE SAVE YOU MONEY

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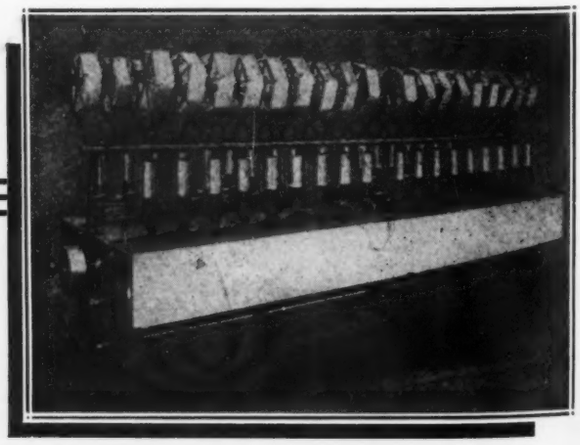
● You can count on your plant making money for you . . . only providing that your equipment gives you thoroughly dependable, accurate, efficient and economical performance over a long period of time. We eliminate all guess work from your purchase of rebuilt equipment. Write, phone or wire your requirements, and receive the details regarding our wide facilities to serve you.



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(1) We purchase complete plants for re-organizing or liquidating

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5 Printing Machines 48" to 64", 4 to 12 colors

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1—48" Sargent Duplex Burr Picker-Auto Feed
3—Rag Pickers—Schofield and Smith, Furbush
1—30" Schofield Lumper
1—C. & M. Flock Cutter
6—Picker Feeds 30" and 60"
1—12', 20" Slat type feed apron
1—P & S 72" Single Apron Raw Stock Dryer
2—2'6" Sargent Cone Dusters
1—48" & 1—60" Furbush Card Grinder
1—Portable 60" Traverse Grinder
4—Twisters 2½" to 6½" ring, Plain and Fancy

WARPING AND WINDING MACHINERY

4—#50 Universal Winders, 4 ends up supply
30—#50 Universal Winders "REBUILT"
50—#90 Universal Winders "REBUILT" for 8" and 10" auto bobbins
6—#180 Universal Winders
1—80 sp.—1 96 sp. and 1—144 sp. J. & B. Jack Winders
2—48, 1—40 and 1—32 sp. O. Lever Cop Winder
1—378 Sp. Whitin Long Chain Quiller
1—90" Saco Lowell Worsted Warp Slasher
2—D. & F. Warp Dresser, 92" Brass Plate
3—6 drum Worcester Compressor Spoolers
4—72" to 100" Pin and Pinless Warping Mills
12—Beaming Frames, various widths
7—Sipp Silk Spoolers
1—Oswald Lever Chenille Cutter
1—6 Sp. Model #40 Foster Tube Winder
Foster Coners and Tubers—any size

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Harness Frames, Spools, Etc.
LOOMS, used or rebuilt for your particular needs
18—82" C. & K. AUTOMATIC Looms 25 har., 4x1 motor drive, warp stops
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12—Three Quarter C & K Axminster Looms
12—Four Quarter C & K Axminster Looms
10—120" C. & K. Looms, 4x4 box
10—92" C. & K. Looms, 4x4 box 25 har.
40—82" C. & K. Looms, 4x4 box 25 har.
20—76" C. & K. Looms, 4x4 box 25 har.
10—72" C. & K. Looms, 4x4 box, 25 har.
10—72" C. & K. Looms, 20 har., with multipliers
10—65" C. & K. Looms, 4x4 box with multipliers
14—48" C. & K. Rug Looms, 3x3 box, 2 har.
6—48" C. & K. Pattern Looms, 4x4 box, 25 har.
8—Tonnar Plush Looms with Jacquards, Gantries & Creels
20—Halton, 400 hook, D.L.S.C. Jacquards
20—Crompton & Knowles 600 hook D.L.S.C. Jacquards
20—C. & K. 1248 hook D. L. Jacquards
14—Halton, 1304 hook D.L.S.C. Jacquards
10—Halton 2608 hook D.L.S.C. Jacquards
45—Sets 22" C. & K. Beam Flanges
1—Royle 600 hook Card Cutter
1—S. & U. 400 hook Card Lacer
1—Cincinnati Time Recording Clock

DYEING AND FINISHING MACHINERY

1—24 Arm Smith Drum Skein Mercerizer, 54"
2—P. & S. Loop or Festoon Dryer
2—Kenyon 66" Chinchilla Machine
1—Roy 65" Cloth Shear Grinder, NEW
1—96" Roy Napper Grinder
2—C. & M. 4 burner Gas Singers, 1-2 Burner 64"
1—66" Four cylinder Brush
1—80" Double cylinder Cloth Brush and sander
3—P. & W. Double Cylinder Teasel Gig
2—66" Single Cyl. Teasel Gigs
1—66" Steiner Dewing Machine
2—#10 Hunter Fulling Mills
2—#11 Hunter Fulling Mills
6—Cloth Washers - Hunter 8 string
1—72" Yorkshire 2 Bowl Crab
1—4 Bowl Birch Continuous Crab, 66" wide

DYEING AND FINISHING MACHINERY Continued

1—66" P. & W. Semi Decating Machine
1—Klug Full Decating Machine
1—90" D & F 20 roll Knit Goods Napper
3—96", 36 roll, D. A. Woonsocket Nappers
1—100" 14 roll Borscher Napper
1—72" D Gessner 2 pc. Knit Goods S. A. Napper
1—66½" D Gessner Century Cloth Press
1—David Gessner, Jumbo Type Rotary Cloth Press 66½"
1—66" D. B. Rotary Voelker Cloth Press
2—P. & W. Doubl. Roll. & Measur. Mach. 66"-76"
1—Schofield Doubling, Rolling & Measur. Machine
2—Cloth Folders—E. & H. and C. & M.
1—Butterworth Open Tenter, Mx. width 60", 75' long
1—Continuous Skein Yarn Dryer
1—Hurricane Skein Dryer
1—Set (19 cans) Butterworth Drying Cans 65" face
1—Bailey Skein Yarn Dryer
1—66½" P. & W. Double Shear with list saving attachment.
1—60" P. & W. Plush Shear
1—58", 4 cyl. Hermas Shear
1—Werner Vacuum Extractor—Single Pump
1—Tolhurst belt driven Extractor 26"
1—36" S & U Extractor, motor driven
2—Tolhurst Belt driven Extractors, 40"
1—Tolhurst belt driven Extractor, 48"
1—60" Tolhurst Extractor
6—60" Fletcher Extractors, Motor Drive
1—C. & M. 66" Wetting out Machine
1—10# Franklin Process Dye Machine
4—Hussong Skein Dye Tubs
2—Klauder Weldon Skein Dye Machines
1—6 Comp Cont. Warp Dyeing Mach. with Can Dryer
1—2 Cyl. Cloth Steam Finishing Machine
1—36" C. & M. Open Rolling & Measuring Machine
1—63", 3 roll Calender
1—4 Roll Calender
1—60" Embossing Calender

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1—Proctor & Schwartz Single Apron Dryer 72" wide
3—Sargent 48" squeeze roll Extractors with 54" feeds 1927
2—Sargent Carbonizing Tanks with cages. Screw type
1—Klander Welder 8 Stick Skein Yarn Kettle
1—Obermaier Package Yarn Dyeing Outfit, 175 lbs. Motor drive

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1—Proctor & Schwartz Cone Duster 7 feet with feed
3—Sargent Cone Dusters 6½ feet
1—Davis & Furber 30" Automatic Duster
1—Sargent 48" Rag Duster 1936
1—Atherton 36 Rag Duster
1—Emerson Rag Washer 1935
6—Clark Rag Pickers. Ball Bearing
2—Curtis & Marble Rag Pickers. Ball bearing
2—Clark 48" Lumpers. Ball bearing
1—Gerry 48" Lumper. Ball bearing
1—Smith 48" Mixing Picker with feed and oiler
1—Curtis & Marble 36" Fearnaught Picker
1—Davis & Furber 48" Fearnaught Picker with feed and oiler
1—Curtis & Marble 40" Mestizo Burr Picker
1—Sargent 36" Burr Picker with feed
1—Curtis & Marble 48" Atlas Burr Picker with feed
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2—Sets D. & F. Cards 48"x60" diameter 3 cylinder sets with Tape condenser. 96 ends. All iron
1—Set Lombard Cards 48"x60" diameter 3 cylinder set with Tape condenser, 96 ends. All iron
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1—Davis & Furber Sample Card. Motor drive
2—Davis & Furber 48"x20" Metallic Breasts
1—Davis & Furber 60" Stretch Winding Drum and Stands
4—Universal Card Stricklers 48" & 60"
3—Davis & Furber Card Winches
3—Davis & Furber 48" Floor Grinder Frames
6—Roy 48" Floor Grinder Frames
6—Roy 48" Traverse Grinders
3—Davis & Furber 48" Traverse Grinders
3—Hunter 60" 4 cylinder and breast Garnetts with feeds
1—Whitin 60" 4 cylinder and breast Garnet with feed
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3—Davis & Furber Mules, 288 spindles 2" gauge, 24 ends
5—Johnson & Bassett Mules, 288 spindles 2⅛" gauge, 24 ends
2—Johnson & Bassett Mules, 336 spindles 2⅛" gauge, 24 ends
4—Sturtevant Blowers #5 Wool wheels 4 blade
4—Sturtevant Blowers #6 Wool wheels 4 blade
3—Sturtevant Blowers #6 Fan wheels 6 blade
1—Sturtevant Blower #7 Wool Wheel 4 blade
1—Sturtevant Blower #8 Fan Wheel 6 blade
1—Buffalo Blower #8
1—Buffalo Blower #6
4—Noble Combs by Prince Smith 68" racks
5—Noble Combs by Crompton & Knowles 68" racks
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Several Can and Balling Gill Boxes
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4—2 spindle Gill Boxes 7/16" pitch
3—4 spindle Draw Boxes 14x9
3—6 spindle Draw Boxes 12x6
10—8 spindle Draw Boxes 12x6
6—24 spindle Reducers 9x5 Flyer
10—40 spindle Rovers 6x3½ Flyer
1—36 spindle Rover 6x3½ Ring
20—160 spindle Flyer Spinning Frames 3½" gauge
20—168 spindle Cap Trap Twisters 3¾" gauge
20—200 spindle Ring Twisters 3½" gauge 2½" Ring
1—200 spindle Ring Twister 3¼" gauge 2" Ring Double Rolls
1—200 spindle Ring Twister 3" gauge 2" Ring Double Rolls
1—96 spindle Ring Twister 3¼" gauge 2" Ring Double Rolls
1—200 spindle Ring Twister 3¾" gauge 2½" Ring Double Rolls
8—D. & F. 40" Jack Spoolers with bobbin stands
6—6 Drum Multiple Spoolers 40" 40 ends
18—Foster 80 spindle Doubling Winders. Model 25
2—Foster 100 Spindle Tube Winders from Skeins
2—Foster 60 spindle Cone Winders
4—Huse 48 spindle Bottle Bob. Winders

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38—C. & K. 92" Cassimere Looms 4x4, 25 Har. Motor drive. Shop #8476
4—C. & K. 82" Cassimere Looms 4x4, 25 Har. Shop #5313
12—Draper 72" Automatic Looms 1x1, 20 Har. New #5735
2—C. & K. 82" Int. Worsted Looms Automatic 4x1, 20 Har. Shop #4220
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2—Hunter #11 Fulling Mills. Double Roll
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1—Gessner 2 sylinder Wet Brush 68"
3—Curtis & Marble 1 cylinder Wet Teasel Gigs 67"
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1—Heathcote 100 yard Cloth Dryer out to 65". Schwartz Feed, vertical
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1—Green 72" S. A. Napper 12 rolls
2—Gessner 72" S. A. Nappers 18 rolls
1—Woonsocket 90" S. A. Napper 12 rolls
1—Grosselin 100" S. A. Napper 14 rolls
1—D. & F. 66" D. A. Napper 36 rolls
4—Gessner 72" D. A. Nappers 18 rolls
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1—Parks & Woolson 66½" Double Shear
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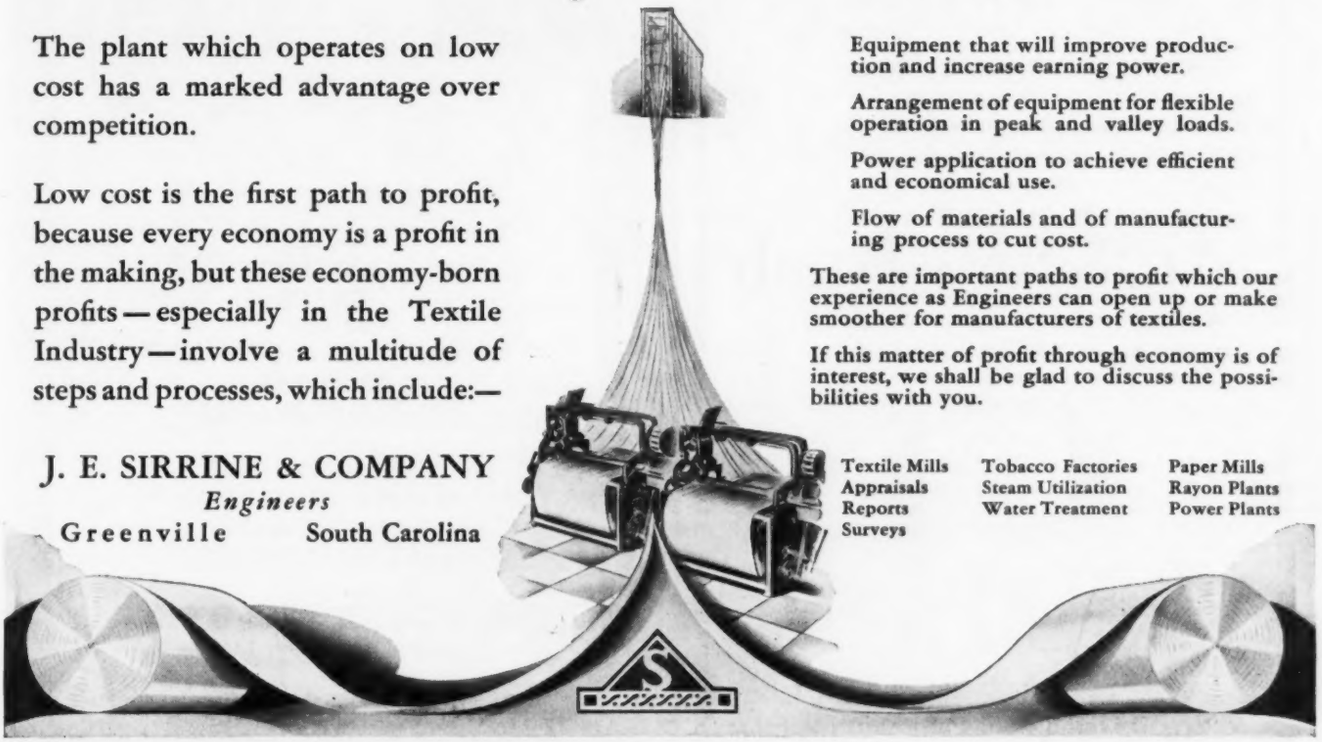

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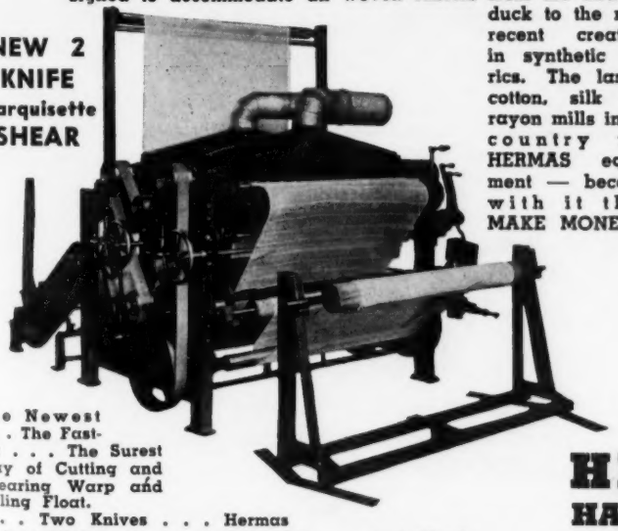

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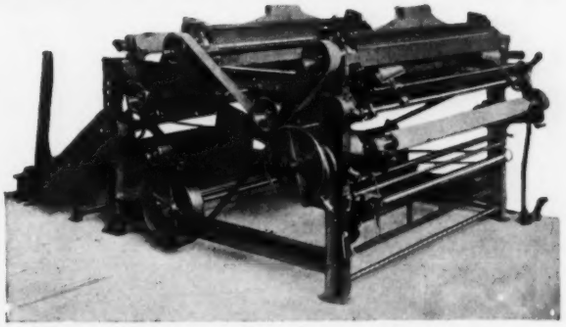

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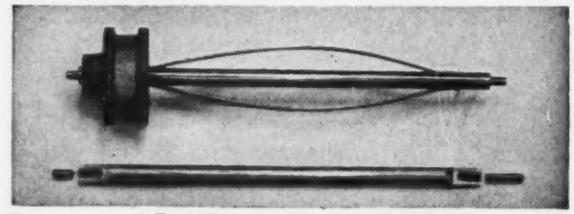

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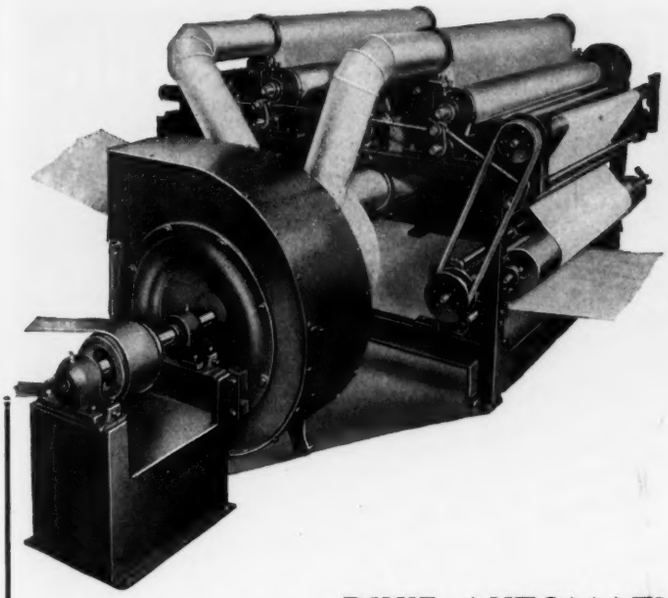

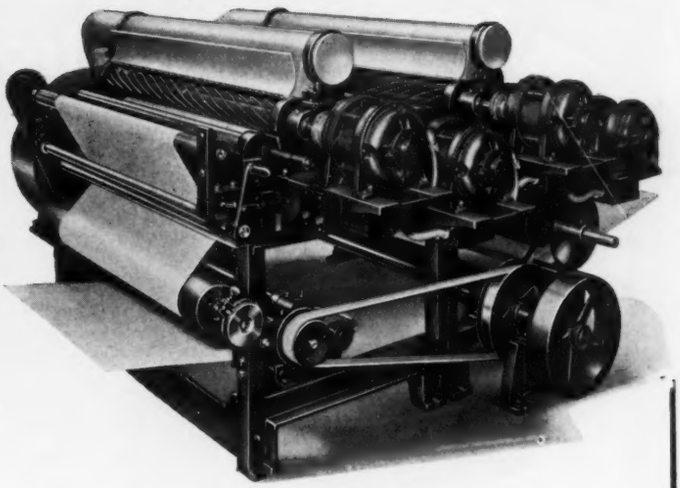

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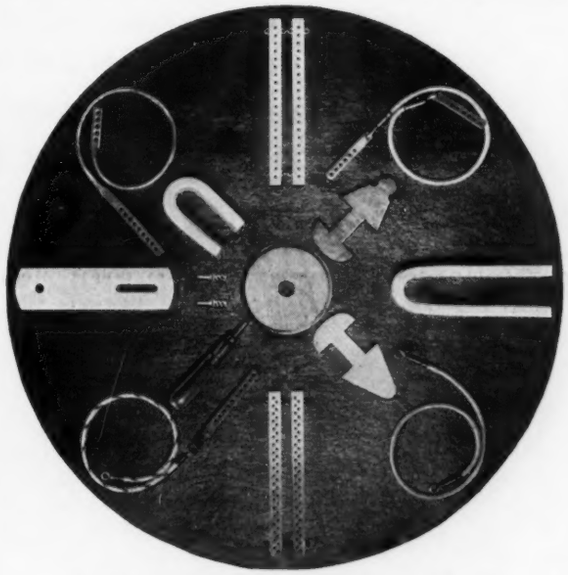

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2—Not if it sets machines without knowing moisture content.

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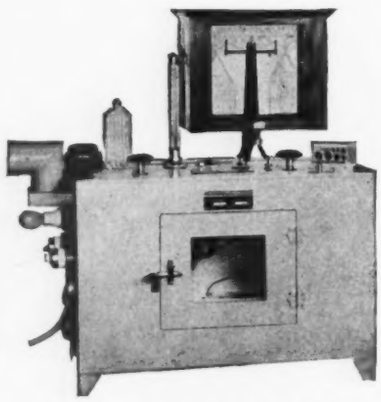

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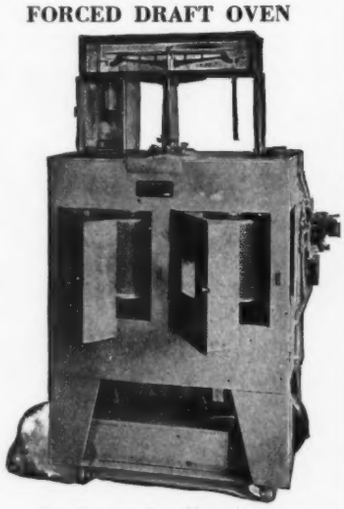

Perforated Aluminum Baskets 10" dia. x 9" deep.

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